

The Iron Age

A CHILTON

PUBLICATION

THE NATIONAL METALWORKING WEEKLY

December 28, 1950

CONTENTS PAGE 2

**Sixty Years of Machine Tool Manufacturing
Experience Is Built Into This Modern
All-Purpose Tool Room Lathe.**

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Carriage

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tric Feed for Carriage
and Cross Slide

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for Headstock Spindle



Write to HARDINGE for Bulletin HLV

Farval helps sheet leveler show \$2500 monthly saving

WITH this machine, a kitchen range manufacturer saves nearly \$2,500 a month. It is a McKay Leveler, through which steel sheets are passed to correct irregular grain structure—a cause of breakage in deep drawing operations.

Steady, economical operation of the leveler is insured by a Farval Centralized Lubrication System. Forty-two bearings are served by a manual pumping unit.

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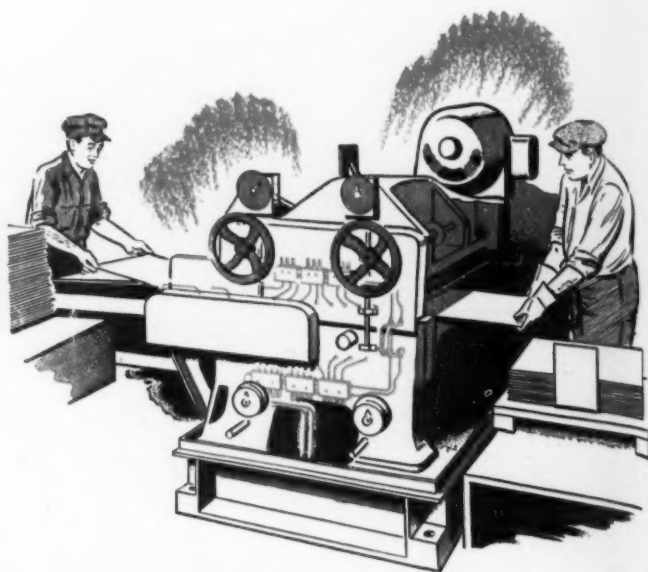
Just as the McKay Leveler soon pays for itself in savings, so also a Farval system on any machine soon pays for itself—by the savings it brings in bearing expense and lubricant cost, not to mention oiling labor and production time saved.

Farval is the original Dualine system of centralized lubrication, proved practical in 20 years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned.

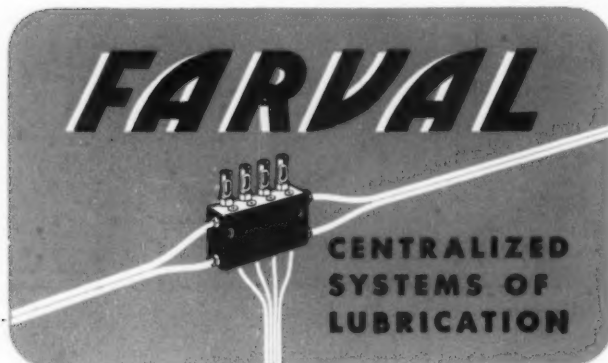
Write for Bulletin 25 for full details. The Farval Corporation, 3252 East 80th Street, Cleveland 4, O.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL—Studies in Centralized Lubrication No. 118



McKay Sheet Leveler on which all bearings are Farval lubricated. Farval Centralized Lubrication Systems, manually operated and automatic, lubricate over a million bearings in the iron and steel and metal working industries alone.





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IRON AGE

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DIGEST

DECEMBER TWENTY EIGHTH • NINETEEN FIFTY • VOLUME 166 • NUMBER 26

VOLUNTARY PRICE CONTROLS SEEN DOOMED

PAGE 15
Trying to hold prices in check by "fair pricing standards" is as useless as trying to halt an avalanche by frowning at it. Voluntary price controls are doomed to fail even before they start. Mandatory price controls will surely be installed as soon as ESA manages to get a large enough staff.

HIGH OUTPUT HINGES ON MATERIALS, PARTS

PAGE 35
The biggest peacetime production year may shape up in the machine tool industry for 1951—if materials and components become available. Dollar volume will probably top \$450 million and possibly reach \$600 million. But lacking a materials priority system this is seen as pure wishful thinking.

FORD PLANNING BILLION DOLLAR EXPANSION

PAGE 48
If National defense does not interfere, Ford Motor Co. plans to spend a billion dollars for expansion during the coming 3 years to keep up-to-date in the keenly competitive automotive race. New assembly lines, enlarged foundry and pressed steel capacity and new supply depots will be built.

MANPOWER PARADOX SHOWS UP IN FAR WEST

PAGE 53
All major manufacturing areas showed declines in over-all employment as 1950 closed. Yet some West Coast industries were afflicted by semi-critical manpower shortages. Steel fabricators, machine shops, aircraft makers, and ship repair yards recently reported shortages of skilled men.

INVENTORY CRACK-DOWN BY NPA FORECAST

PAGE 55
Reports of excessive inventories by some companies are prompting the National Production Authority to tighten enforcement of its inventory regulation. Of 300 firms asked to report a number have failed to reply. Manly Fleischman, NPA Counsel, said that they will be forced to report.

RUBBER GOODS: METALWORKING USE, NEEDS

PAGE 57
Recently completed survey by the Market Research Dept. of THE IRON AGE analyzes consumption of mechanical rubber goods by the metalworking industry. Yearly dollar volume of purchases of such items as belting, hose, molded and sheet rubber is listed and probable '51 supplies estimated.

HOW FURNACE MOISTURE EMBRITTLES STEEL

PAGE 60
Water vapor in heat treating furnaces has a surprising embrittling effect on steel. The "hydrogen potential" of steam in contact with steel at elevated temperatures exceeds the potential of pure hydrogen itself under theoretical pressures of hundreds or even thousands of atmospheres.

DISCUSS CONTINUOUS CASTING TECHNIQUE

PAGE 66
Practically all facets of electric furnace steelmaking were covered at the Annual Electric Furnace Steel Conference of AIME in Pittsburgh, but continuous casting stole the show. Important new data were presented on the process and disagreements in applying it to steelmaking were aired.

INDUSTRY AWAITS PRICE ROLL-BACK ORDERS

PAGE 77
Industry is confronted with price roll-backs to Dec. 1 levels but this is tempered by a system of "voluntary" standards under which prices may be increased. Producers of basic raw materials were told to expect price cuts in cases where they were increased from June 24 through Dec. 1, 1950.

NONFERROUS CUTS SLOW CIVILIAN OUTPUT

PAGE 79
Repercussions of NPA nonferrous cutbacks are being felt far and wide in the industry. Producers are caught in the middle of the transition period to war output with their stocks down. Aluminum cutbacks will mean substituting cast iron for pistons. Tin was also put on the NPA cutback list.

DEMAND OUTPACES PEAK ZINC SHIPMENTS

PAGE 83
Upsurging demand for slab zinc in 1950, for civilian needs and the military stockpile, outpaced production. The Zinc Institute emphasized that expansion of the industry required long-range planning and attraction of risk capital. Output of domestic zinc mines is a holdback to expansion.

96th ANNUAL REVIEW & METAL FACTS ISSUE

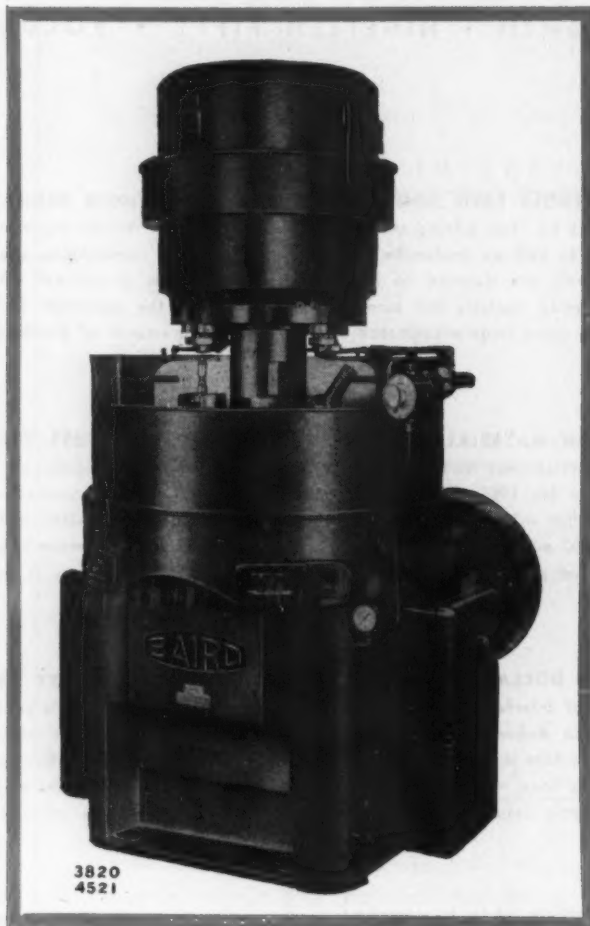
NEXT WEEK
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IRON AGE

editorial

Hallelujah! We Are Started.

THE President of the United States recently turned from some of his advisers and friends who had haggled over the defense crisis. He turned to business to find his man. That man—Charles E. Wilson of General Electric—was the best possible choice Mr. Truman could have made. It was the freshest news from Washington since the Korean War started last June.

If the people could know what type of man Mr. Wilson is they would feel better. Usually one reserves judgment on appointments. In this case no reservations are required. Mr. Truman has shown that he is not always predictable. He gave Mr. Wilson all the rope there was to give—unqualified control of the defense and mobilization effort.

So much for the appointment. How about the man? If the defense program does not do a hop, skip and a jump in the next month or so there will be an explosion. The man at the helm now wears no man's collar. He is nice, he is courteous, he is understanding—after that he wants action. He usually gets it. He has the experience. If he doesn't get what he wants he will get out and make a loud noise as he leaves.

But Mr. Wilson isn't likely to leave. He has the power of the President behind him. He knows why we were in a mess early in World War II. His price for taking this thankless job—and it will be thankless as time goes on—was that he answer to no man except the President. He can knock heads together and toss out obstacles, whether they be people or methods.

A lot of time has been wasted in the past six months; and in the past five years. Let's forget about that now. Let's see if Mr. Wilson will get the kind of cooperation he should have. We think he will. We think people in Washington have finally awakened to the fact that the man on the street was far ahead of them.

We are not the type of people who go blindly forward without any squawks. It is one thing to agree with a defense proclamation and quite another to sit by and see time and lives wasted in useless haggling and hot air.

Squawks from the American people do not mean lack of unity. We need unity more than at any time since the American Revolution. Now is the time for both sides to bury politics as usual and business as usual.

We are started. We have a long way to go. Let's do it without acting as if someone were taking our candy away from us.

Tom Campbell

editor

Just to set you straight



If you harbor the notion that our work is confined to shipbuilding, take a look at one of our non-marine jobs illustrated above—a 52,000-pound⁷ cast iron bed plate for a Corliss engine, cast in one piece. And that isn't all. Sun Ship also produces a wide assortment of fabricated steel items including chemical plant and oil refinery equipment. Consult with Sun Ship . . . our versatile organization plus our vast experience and facilities can help you in many ways.

Sun

SHIPBUILDING & DRY DOCK COMPANY

SINCE 1916

ON THE DELAWARE • CHESTER, PA.

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IRON AGE *newsfront*

*news
methods
and product
forecast*

► Shortages of metals are causing changes in many manufacturing methods. Soldering, which requires tin, is being replaced in some cases by copper braze welding. Copper is also replacing cadmium in certain electroplating applications.

► A real steel scrap shortage is more than a possibility. Conversion from peacetime to wartime production always ruptures the normal scrap cycle. Also, any real roll-back of prices would cause consternation in the scrap trade. Such a move could actually hinder scrap collection. Present prices are not high compared to cost-of-living and steel and pig iron prices.

► The supply of railroad tie plates is becoming critical. Roads in the East and Southeast have been particularly affected by the shutdown of an eastern mill on which they depend for much of their requirements.

► Navy orders seem to be coming into firm contract stages quicker than those of some of the other services. Many plants have quietly received fair-sized orders but security has tightened up on details or even announcement of some orders.

► Just what effect the agreement for shipment of Canadian aluminum to England will have on plans to set up aluminum production in New Guinea is still uncertain. The latter project is a long range proposal to build complete facilities for supplying all aluminum needs of the sterling countries.

► Faster analytical methods for titanium are a must if this metal is to grow into a full fledged industry. Present methods of analysis for oxygen and nitrogen are very slow and cumbersome. Some collective action among producers and laboratories has been suggested but as yet nothing definite has been done.

► Field reports indicate practically no hoarding of steel by regular customers. Most regular customers, large and small, have below-average inventories. Gray market purchases and conversion deals do not indicate hoarding; rather, they indicate the desperate plight of some manufacturers who will pay any price to keep their operations going.

► In fundamental studies of welding arc behavior, motion pictures up to 10,000 frames per second have been taken. Some research men believe that 12,000 frames per second might be needed to slow the action down enough to really see what happens in the welding arc.

► Psychology tests conducted among industrial maintenance workers in one large company indicate in most cases a negative correlation to experience. Where the correlation was positive, it was slight.

► Labor is worried about its cost-of-living wage contracts. They argue that wage rises would become academic if the government really controlled prices. Actually when wages have gone up because of the price index, there has been lifting by the bootstraps; prices were lifted, then wages, etc. If prices are frozen, the sliding wage scale will have to be absorbed.

► Glass fiber filter paper, 5000 times better than present filters, has been developed. The glass fibers are 1/20th the thickness of human hair and the paper can be made by any mill.



The Microcarb Control for the new Series H Homocarb Furnace occupies panel at left in above photo, next to the usual temperature control panel. (1) is the Carbohm primary element; (2) the Microcarb controller for carburizing atmosphere; (3) the Micromax Atmosphere Recorder.

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record of per cent of carbon in furnace atmosphere.

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IRON AGE *summary*

*iron and steel
industry trends*

Voluntary Price Controls Doomed Defense Program Is Moving Faster Iron Shortage Threatens Founders

VOLUNTARY price controls are doomed to failure even before they begin. Trying to hold prices in check by publication of "fair pricing standards" is as futile as trying to stop an avalanche by frowning at it. Mandatory price controls are sure to be installed as soon as the economic stabilization agency can collect a big enough staff to enforce them.

Meanwhile, manufacturers are pondering over the new pricing standards, trying to decide what course they should follow. Most companies will comply with the government request. But many firms are facing a pricing dilemma. Contracts based on cost plus, escalator clauses and average prices will probably have to be reviewed individually. Many hardship cases will have to be studied. There will be a lot of headaches and a lot of conferences before price controls reach their final form.

Steel Quotas Being Slashed

A careful check by IRON AGE editors in widely separated areas indicates that there is practically no hoarding of steel by regular customers. Inventories are below normal. Most manufacturers, large and small, have less steel than their production requirements would indicate.

Gray market and conversion steel do not indicate hoarding. Instead they dramatize the desperate plight of manufacturers who will pay almost any price to keep their operations going.

Steel quotas of regular customers are being slashed to the bone—more than 50 pct of some products. With some manufacturers it is nip and tuck between depleted steel and nonferrous metals as to which will finally force production schedules to fall down.

This week there are indications that the defense program is moving ahead at a faster pace. Several large orders have been placed and some very large construction projects are near the contract stage.

Some steel people are now convinced that a controlled materials plan will be placed in effect as early as March or April. Their conviction is based on the impact of DO orders and allocation programs already felt and the additional ones that are expected early next year. More and more they are coming to feel that if steel distribution is to be controlled at all, it must be controlled completely. A great many of their headaches arise from the half free, half slave market in which they are trying to operate.

Book Beyond Limits on DO Orders

Some steel companies are booking DO orders far beyond the limits they are required to accept. One steel company estimates that 25 to 30 pct of its total tonnage is going into DO orders and allocation programs right now. Since this estimate includes total tonnage of all products produced, the percentage of some steel products required under the programs is considerably higher.

In order to meet DO and allocation demands a gradual change in product mix is taking place. This is working hardships on some companies from a profit standpoint. Companies who formerly sold more profitable specialty items now find themselves making more of the bread and butter products for the defense and allocation programs.

Pig Iron Shortage Hurts Foundries

An acute shortage of merchant pig iron is causing a ticklish supply situation for some foundries. They have plenty of orders but they are scouring the countryside for pig iron or scrap. Imports of pig iron have fallen off to a whisper. One explanation is that European iron is being traded for coal. Also scrap is getting more scarce there.

Steelmaking operations this week are estimated at 97 pct of rated capacity, off 4 points from last week. The decline is due to the Christmas holiday.

(nonferrous summary, p. 26)



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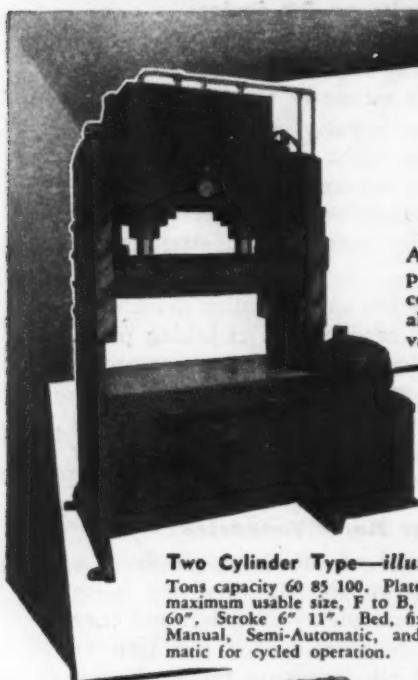
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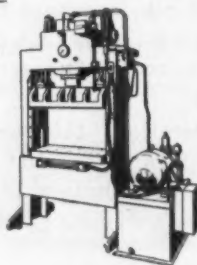
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CINCINNATI, OHIO



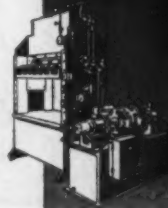
Two Cylinder Type—illustrated

Tons capacity 60 85 100. Platen and bolster, maximum usable size, F to B, R to L, 36" x 60". Stroke 6" 11". Bed, fixed. Controls: Manual, Semi-Automatic, and Fully Automatic for cycled operation.

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L. Stroke 6" 11"
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Controls: Manual,
Semi-Automatic, and
Fully Automatic, for
cycled operation.



Three Cylinder Type
Tons capacity 75
100 125 150. Pla-
ten and bolster,
maximum usable
size, F to B, R to
L, 45" x 72".
Stroke 6" 11". Bed,
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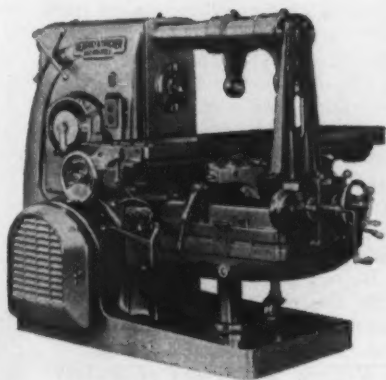


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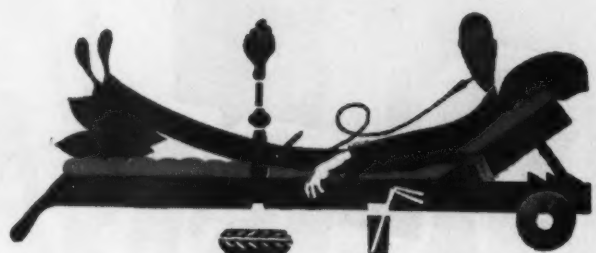
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fatigue cracks

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Aptronyms

R. Raymond Kay, who sometimes gets too much sunburn in southern California, is just itching to have us tell you about the Peal Co. of Los Angeles. They make a salve for dermatitis, of course.

Karl M. Feiertag of GE reports that a Mr. Petrie of the Portland Cement Assn. currently is teaching a class in concrete mixing for Purdue Extension so that his students may be assured of a properly Petrie-fide product.

Cost Cutter

There's something ominous about a press release received from the Automotive Liability Reduction Assn., Inc., headed "New Cost Saving Service Offered."

It turns out that the cost-saving angle is this: "An amazingly simple, easy-to-operate camera, packed in a compact, self-mailing, rugged kit provides all the equipment to take on-the-spot accident photographs. Accident pictures can result in greatly lowered liability and operating costs for truck fleet owners."

Although we've always had the greatest respect for big trucks, sometimes even moving over to the right-hand lane to let them pass, all the statistics we've seen show they have the best accident records of anything on the road.

But consider the psychological impact of giving the driver a neatly packed, loaded camera, telling him to use it for accident pictures only. As the miles roll by with no accidents, his curiosity and conscience begin to eat on his nerves. Here his employers have gone and spent all that money for that camera set and he has nothing to show for it.

If he's any kind of a man at all, he'll remedy this in a hurry—possibly cross the white line and smash head-on into a school bus. Then he can get out his camera and relax. If this gadget has any kind of a sale at all, we're going to stay off the highways.

Price Control

The Hamilton Foundry & Machine Co. passes this thoughtful verse along to its customers:

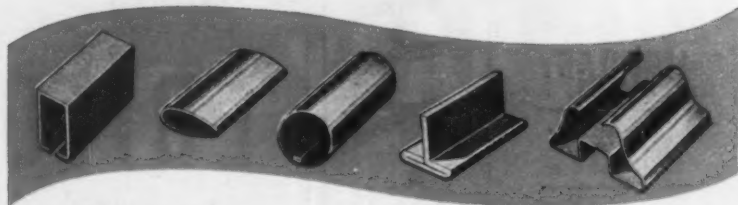
*There never was a product made,
This truth you must confess,
But what some guy could make it worse
And sell the stuff for less.*

Puzzlers

We turned last week's problem on the diameter of the smoke stack over to Jim Crites, your f.f.j.'s assistant promotion manager and an M.I.T. man, with instructions not to report back until he had solved it. He wasn't good for anything else for the rest of the morning, but finally came up with an answer of 2.69 ft. Naturally, we didn't call in Jim until we were completely stumped on it ourselves.

Robert Huff of Canton came in with the right answer on the egg problem. Apparently everyone else was busy Christmas shopping.

William W. Beyers of Buflovak Equipment asks: A man ordinarily meets his chauffeur at the station at 5 p. m. and the chauffeur drives him directly home. However, one day this man takes an early train, arriving at the station at 4 p. m. and decides to start walking. On his way, he meets the chauffeur, who drives him the remaining distance home, arriving there half an hour earlier than usual. How long does the man walk?



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lower costs.

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Dear EDITOR

letters from readers

Powder Priced Right

Sir:

Under date of Nov. 16, 1950, there appeared in THE IRON AGE, Newsfront, the following quotation: "The Ordnance Dept. would like to use pressed iron powder rotating bands for shells. During World War II the process was explored and used in a limited way. The chief bottleneck now in the way of wide use of such bands is a steady supply of cheap iron powder of consistent size, hardness and analysis."

As I developed a process and equipment to produce iron powder for copper precipitation at the Chino Copper Co. some years ago, when I was Assistant General Manager of that large copper mine in New Mexico, I took the trouble to address a letter to the Chief of the Ordnance Dept. in Washington saying that I can produce the powder to the specifications that they require and at a price that they can afford.

To date I have not received a reply from anyone and I presume that it is the same old story of no one of importance in Washington wanting to be bothered with some rank outsider making suggestions.

As a patriotic duty I would like to bring this matter to the attention of the official who gave your magazine the information that you have printed as per above quotation. I don't believe that this Administration can afford to ignore suggestions which should be explored promptly if the source of such proposals are not out of their own heads. Probably by addressing a letter to the official who is the source of your published item I might obtain a "Yes" or a "No" and I think, under the circumstances, that the country is due this much consideration in its present state of confusion and distress.

H. G. S. ANDERSON

H. G. S. Anderson & Sons
Muskogee, Okla.

More on DO Ratings

Sir:

On p. 120 of the Nov. 23 issue of THE IRON AGE we have noted the following sentence: "DO-21 is the only number which can be used for this purpose [purchase of machine tools] by a private firm under present interpretations of the regulations."

May we call your attention to a press announcement of the AEC which says: "The symbols DO-43 and 44 are being used on contracts and

purchase orders for construction material and capital equipment purchased by private concerns for their own account but for use on AEC work." Machine tools, as "capital equipment," are covered by these numbers.

Actually, any of the five AEC numbers, with the exception of DO-42, may be used for the purchase of machine tools, DO-40 and 41 for tools to be owned by the AEC, and DO-43 and 44 for tools to be owned by private firms doing work for the AEC.

O. H. TOWNSEND
Public Information Services

U. S. Atomic Energy Commission
Washington

Sets The Record Straight

Sir:

We were very interested in the article "Machinability Research Program Reported," in your Nov. 9 issue, and the letter regarding the diagram on p. 99 which was printed in the Dear Editor column of your Nov. 30 issue. This diagram was made by Dr. Kronenberg when he was employed by The Cincinnati Milling Machine Co., and is based on research done by this company. Much of the basic analysis of machining conditions presented in the book in which it appeared is also taken from the research publications of this company.

You can appreciate how we feel when we do not get credit for the work we have been carrying on for so many years.

HANS ERNST
Director of Research

Cincinnati Milling Machine Co.
Cincinnati

The Cincinnati Milling Machine Co. is well known for its basic research in machining. We regret not having given them proper credit for this diagram and their part in the preparation of this report. The book from which it was reproduced carried its credits on a back page and we missed them.—Ed.

Can-ny Interest

Sir:

I understand there is a market for used tin cans; do you know of any such market? I am in a position to furnish a steady supply. If there is such a market I suppose they would have to be pressed and baled. I also have heard that there is someone reclaiming the tin from cans.

C. F. FOSGATE

Orlando, Fla.

So far as we know, there is no market for used tin cans at the present time. There are two plants recovering tin from new tin plate clippings, most of which come from the can companies themselves. During the scrap shortage of World War II, there was a nationwide collection campaign on used tin cans and several plants were set up in various parts of the country for recovering the tin and using the dented cans for steel scrap. However, this lasted a very short time, only during the most severe period of the shortage, because of the extremely high cost involved in freight and in removing the foreign matter, food, etc., from the cans.—Ed.



25-YEAR-OLD

"Buffalo"


DRAFT FANS

PROVE THE

ECONOMY

of

DURABILITY



25 YEARS AFTER
INSTALLATION:
THESE BUFFALO
PRIMARY FANS
STILL ON THE
JOB

25 YEARS AFTER
INSTALLATION:
THESE BUFFALO
FORCED DRAFT
FANS STILL ON
THE JOB

Wherever steam is produced for energy, you find a key industry. In every key industry you find "Buffalo" Mechanical Draft Fans represented—and doing a reliable job of keeping boiler combustion efficient.

In the Public Utility companies, where above all, power production must be *continuous*, "Buffalo" Draft Fans are proving that they can be relied on for remarkably long service periods.

The 24 "Buffalo" Draft Fans at Miami Fort Station, Cincinnati Gas & Electric Company, illustrate this durability. They are still in service after 25 years on industry's toughest fan job.

If you want the draft economy that comes only from rugged fan construction in the right places, specify "Buffalo". WRITE FOR BULLETIN 3750 for all engineering details.



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INSTALLATION:
THESE BUFFALO
INDUCED DRAFT
FANS STILL ON
THE JOB

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Specialized Wire for Specialized Products



KEYSTONE TUBULAR RIVET WIRE

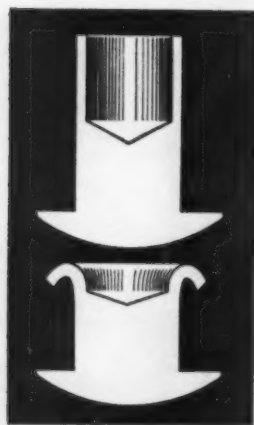
Tubular rivets that *roll-crimp* without fracturing require a *specialized* wire produced under carefully controlled manufacturing practices.

Keystone's Tubular Rivet Wire is the result of "special processing" at all stages . . . specially selected steel furnace charge, special drawing practices, carefully controlled annealing in process, and rigid inspection.

These special manufacturing techniques developed by Keystone have produced a wire with exceptional forming qualities, either for *extruded* or *drilled* tubular rivets.

Wire for drilled tubular rivets has the proper hardness for longer drill life; wire for extruded rivets has uniform metal flow qualities required in extrusion headers. Both types have just the right ductility for cold heading and excellent roll crimping.

If your product requires a "specialty" wire of any kind, we can help you.



DATES to remember

Jan. 6—American Home Laundry Manufacturers Assn., winter meeting, Hotel Morrison, Chicago. Association headquarters are at 38 S. Dearborn St., Chicago.

Jan. 8-12—Society of Automotive Engineers, annual meeting, Hotel Book Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Jan. 9—Mining & Metallurgical Society of America, annual meeting, Mining Club, New York. Society headquarters are at 11 Broadway, New York.

Jan. 10-12—Heat Exchange Institute, annual meeting, Seaview Country Club, Absecon, N. J. Institute headquarters are at 122 E. 42nd St., New York.

Jan. 14-16—Institute of Scrap Iron & Steel, annual convention, Commodore Hotel, New York. Institute headquarters are at 1346 Connecticut Ave., N.W., Washington.

Jan. 15-16—Industrial Furnace Manufacturers Assn., mid-winter meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

Jan. 15-18—Plant Maintenance Show, Public Auditorium, Cleveland. Exposition management Clapp & Pollak, Inc., 341 Madison Ave., New York.

Jan. 16—American Boiler Manufacturers Assn. & Affiliated Industries, mid-winter meeting, Cleveland. Association headquarters are at 264 Rockefeller Bldg., Cleveland.

Jan. 18-20—Society of Plastics Engineers, annual national technical conference, Statler Hotel, New York. Society president is J. H. Dubois, 160 Colt St., Irvington, N. J.

Jan. 19—Malleable Founders Society, semiannual meeting, Hotel Cleveland, Cleveland. Society headquarters are at 1800 Union Commerce Bldg., Cleveland.

Jan. 21-23—Truck Trailer Manufacturers Assn., annual convention, Edgewater Gulf Hotel, Edgewater Park, Miss. Association headquarters are in the National Press Bldg., Washington.

Jan. 22-23—Compressed Gas Assn., annual convention, Waldorf Astoria Hotel, New York. Association headquarters are at 11 W. 42nd St., New York.

Jan. 24-25—Caster & Floor Truck Manufacturers Assn., winter meeting, Hotel New Yorker, New York. Association headquarters are at 7 W. Madison St., Chicago.

Jan. 28-Feb. 1—Associated Equipment Distributors, annual meeting, Stevens Hotel, Chicago. Association headquarters are at 360 N. Michigan Ave., Chicago.

Feb. 19-22—American Institute of Mining & Metallurgical Engineers, annual meeting, Jefferson Hotel, St. Louis. Institute headquarters are at 29 W. 39th St., New York.

Mar. 5-7—Hydraulic Institute, quarterly meeting, Santa Barbara Biltmore Hotel, Santa Barbara, Calif. Institute headquarters are at 122 E. 42nd St., New York.

Mar. 5-7—Manufacturers Standardization Society of the Valve and Fittings Industry, annual meeting, Commodore Hotel, New York. Society headquarters are at 420 Lexington Ave., New York.

machine tool high spots

*sales
inquiries
and
production*

by w. a. lloyd



Biggest Year — If — Biggest peacetime production in the history of the machine tool industry is shaping up for 1951 if materials and components are available.

Dollar volume of this production will probably surpass \$450-million and possibly reach \$600-million, double 1950 production, according to industry sources. In the absence of a priority for materials and components, or even the promise thereof, this is optimism of the purest sort.

There is, however, evidence that the industry's case has not been completely neglected.

Priority Denied — One plan which was reported under consideration calls for designation of five or six or possibly more steel warehouses located in machinery producing areas like Cincinnati, Rockford, Worcester, Cleveland, etc., to supply the steel needs of the machinery industry. These warehouses would be supplied with an equivalent tonnage by the mills.

Official sources in Washington, however, denied that such a plan is under consideration.

Another possibility is the Controlled Materials Plan, which is forecast for the second quarter of 1951. Under CMP, the industry's steel requirements would get recognition, according to industry sources.

Less Tungsten—Formation of a "task group" of the metal cutting tool industry advisory committee to recommend a program for curtailment of the use of tungsten by the industry was announced in Washington following a meeting Dec. 19 with officials of the National Production Authority.

Members of the "task group", which will meet in New York City, Dec. 27, are: R. A. Horner, Barber-Coleman Co., Rockford, Ill., Edward M. Dowd, LaPointe Machine Tool Co., Hudson, Mich., Louis A. Lincoln, Bay State Tap & Die Co., Mansfield, Mass., E. W. Miller, Fellows Gear Shaper Co., Springfield, Mass., and A. J. Snyder, Morse Twist Drill & Machine Co., New Bedford, Mass.

Must Substitute—The committee agreed to furnish NPA by January 1 specific recommendations for reducing the use of tungsten in the cutting tool industry.

NPA advised industry representatives that shifts from the use of tungsten steels to alloys made of molybdenum and other substitutes will have to be made. Production of these substitutes to replace tungsten in steel alloys is now being expanded.

More Cutting Tools—The critical shortage of cobalt, also used in the manufacture of high speed cutting tools, was discussed. NPA informed the group that an order

limiting the use of cobalt is now being developed.

Other matters discussed at the meeting included the need for expansion of the metal cutting tool industry. Industry spokesmen indicated that an expansion of 20 to 25 pct in the near future appeared to be a "very conservative estimate."

The meeting ended with a discussion of M. R. O. (maintenance, repair and operating) order, which might be needed in the future to allocate tungsten and other scarce metal alloys to prevent deterioration of present equipment. It was generally agreed that there was no need for the issuance of M. R. O. ratings at this time.

Tool & Die High—Contract tool and die shipments reached a new postwar peak in October and exceeded any month in 1945, George S. Eaton, executive secretary of National Tool & Die Manufacturers Assn. reported.

Work Long Hours—New orders received in October were 138 pct of the January volume, slightly lower than the August peak, but higher than any month for the past 4 years. Rearmament business is up, but is only a small part of the total.

Contract tool and die shops are working 48 to 50 hr a week and some companies are working 60 hr a week, Mr. Eaton reported.

FREE *publications*

These publications describe money-saving equipment and services... they are free with no obligation... fill in and mail postcard.

Aluminum Coated Steel

The many advantages of Armco Aluminized steel are described in a new 26-p. booklet listing mechanical and forming properties, fabricating techniques, and painting and finishing methods. A section of the bulletin deals with where manufacturers use this steel coated with aluminum; details on oxy-acetylene, electric arc, atomic hydrogen arc, inert-gas metal arc, and spot and seam welding techniques are given, as well as data on brazing and soldering. Heat reflectivity is also discussed. *Armco Steel Corp.*

For free copy insert No. 1 on postcard.

Work Gloves

Edmont industrial, farm and general hand protection work gloves are described in a new illustrated pocket catalog. A section of the folder presents the features of Neox, a compound of neoprene reinforced with special additives for greater resistance to cutting, abrasion and chemicals, resulting in longer wear. A comparative performance chart for determining specific uses for Neox, plastic, and natural rubber coated gloves is included, with examples of recommended services for these coated-fabric gloves. *Edmont Mfg. Co.*

For free copy insert No. 2 on postcard.

Abrasive Discs, Wheels

Besly Titan bolt-on abrasive discs and wheels are described in a new 50-p. booklet giving complete details on how these wheels are fabricated and illustrating the various types available. The Resinoid Steelbac, a grinding member consisting of a series of properly spaced deep-cupped steel washers and inserted nuts or studs embedded in the abrasive, is also discussed. Tables show

prices, sizes and specifications, and maximum peripheral speeds for the various wheels. The line of Besly grinders is described. *Charles H. Besly & Co.*

For free copy insert No. 3 on postcard.

Conveyer Tables

The new line of stationary or portable Unitized conveyer tables, featuring Mayari-R in its construction, is described in a new 6-p. folder. Step-by-step drawings show the method of assembling these versatile tables, and complete specifications are listed. A standard speed chart gives data relating to the "packaged" power unit, which can be supplied with variable speeds. A few of the many Unitized installations throughout the country are shown. *Island Equipment Corp.*

For free copy insert No. 4 on postcard.

Precision Castings

A revealing glimpse of the Mercast frozen mercury process of casting and a behind-the-scenes view of the men and facilities of this company are given in a new 8-p. bulletin. A series of photos shows the various steps in the process, and other sections of the booklet describe and illustrate the engineering, metallurgy, testing and inspection used. Various examples of parts cast are shown. *Alloy Precision Castings Co.*

For free copy insert No. 5 on postcard.

Shot and Grit

A new data sheet describing Super-Annealshot and grit tells how you can now buy top quality malleable shot and grit without paying premium prices. Features of the material are described, and advantages obtained by its use are discussed. *Metal Blast, Inc.*

For free copy insert No. 6 on postcard.

Filtration Equipment

Adams modern filtration equipment for better water at lower cost is described in a new 20-p. bulletin presenting the water filtration picture today and giving a glance at how it grew. Engineered filtration equipment for all industry is covered, with detailed descriptions of the units and a discussion of when, where and how these water filters are used in industry. *R. P. Adams Co., Inc.*

For free copy insert No. 7 on postcard.

Resistance Spot Welder

The new PMCO2ST series of the Modu Wave welder for resistance spot welding to AN-W specifications of aluminum, magnesium, stainless steel, Inconel, Monel, brass, mild steel and other alloys, is described in a new 6-p. folder. In addition to showing specifications, the bulletin presents data on current rise, magnitude control, decay control and direction, pulsation welding, and variable pressure cycle and control forging for this three-phase welder. *Sciaky Bros., Inc.*

For free copy insert No. 8 on postcard.

Stainless Preparation

To increase the use of hardened stainless steel parts, a new 26-p. booklet was prepared dealing with methods to be used in the preparation of stainless steel for hardening. Details of the Super Scottsonizing method for hardening are presented, telling how this process gives an extremely hard case of 68 to 73 transposed Rockwell reading, prevents all galling, cannot be ground, drilled, annealed or lapped and is file hard at 1000°F. Examples show stainless steel parts machined with a tolerance of 1/4 of 1/10,000

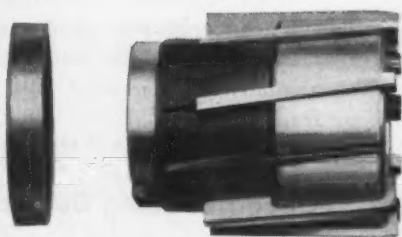
Turn to Page 102



Select BARBER-COLMAN REAMERS
FOR
COST CONTROL
and
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LOW-COST BLADE REPLACEMENT
EASY SIZE ADJUSTMENT
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All Extra Parts Eliminated. Pins and Wedges Hold Blades Solidly Against Body, Comparable to Solid Flute Design.

If you choose between accurate, quality reamed holes — and low-cost reamer maintenance and operation — you can have both by using Barber-Colman Adjustable Reamers. Barber-Colman pin and wedge design provides more blades per reamer diameter for better cutting action. Blades are solidly held in perfect diameter, avoiding any possibility for variation in roundness or straightness. Size adjustments are easily and quickly made, with size readily checked across any two blades.

These features mean better and faster results, with less cost per hole machined. Ask Barber-Colman reamer engineers to assist on your reaming jobs, or send tool and part prints for recommendations.

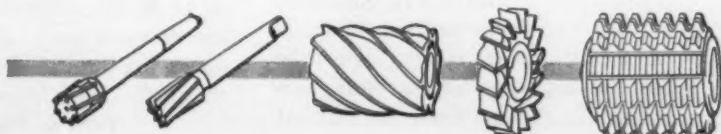
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production ideas

Continued

to 145 ipm. Approach and pressing speeds are independently adjustable, permitting rapid traverse with slow entry of punch into dies,



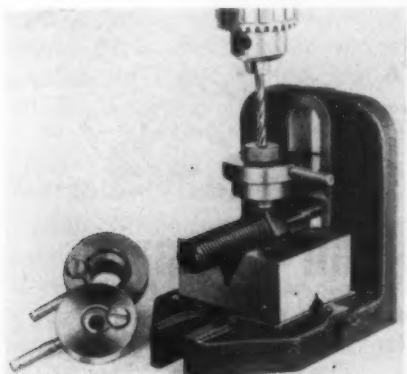
and similar combinations for exacting work requirements. *Denison Engineering Co.*

For more data insert No. 22 on postcard, p. 37.

Adjustable Drill Jig

For round bars and hexagonals;
it cuts layout and drill time.

Used for drilling holes through round stock from $\frac{1}{4}$ to 2 in. and hex stock and cap screws from $\frac{1}{4}$ to 1 in. a new adjustable drill jig is said to cut layout and drilling time on small lots to a fraction, and to eliminate the costs of special jigs for larger quantities. Hole diameters range from $\frac{1}{16}$ to



$\frac{1}{2}$ in., using standard slip bushings. The hardened V block has a 90° V for round stock on one face, and a 60° V for hex stock and cap screws on the opposite face.

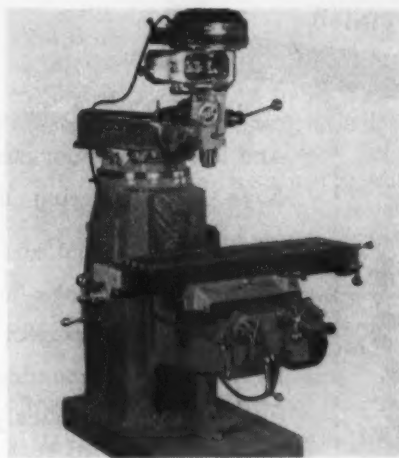
Adjustable stops are provided to locate the work longitudinally any distance from the end. *Mathewson Machine Works, Inc.*

For more data insert No. 23 on postcard, p. 37.

Milling Machine

Unusual range, 45° dovetail column, and extended knee construction.

The 2 UV universal vertical milling machine has rigidity, weight, and range of a No. 2 size milling machine as well as a universal vertical head for all angle milling, drilling, and boring. The vertical head moves 45° across the table each way from a vertical position, permitting angular milling cuts the length of the longitudinal table feed without resetting. The head can also be rotated in a plane parallel with the table axis 90° each way. A 1 hp axial



air-gap motor powers the spindle at speeds ranging from 140 to 3500 rpm or 210 to 5200 rpm. Capacity of the head ranges from $\frac{1}{8}$ to $1\frac{1}{2}$ in. end mills. Collets have automatic closing mechanism for quick and effortless tool changing and setup. A built-in feed box provides feed rates of $\frac{3}{4}$, $1\frac{1}{2}$, $2\frac{3}{4}$, 4 and 7 ipm and 70-ipm rapid traverse to the longitudinal table movement. *Tree Tool & Die Works.*

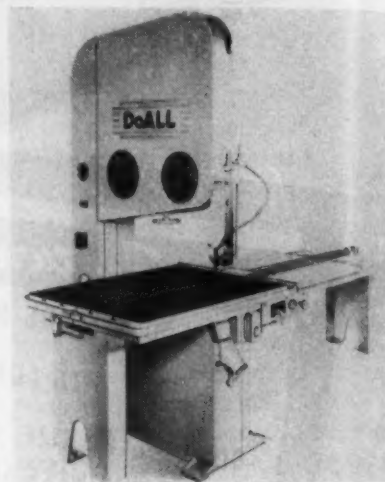
For more data insert No. 24 on postcard, p. 37.

Bandsawing Machine

Capable of production cutting bulky materials in steel, plastics.

A new Hydro-Feed band machine is designed for heavy duty precision sawing, and features a combination of power, speed range, hydraulic feeding capacity, and sawing versatility in the one machine. Throat

capacity is 36 in., work height from $15\frac{1}{2}$ in. up. The Hp-36 uses a 10 hp drive motor. It has a three-speed transmission and overload protected Speedmaster variable drive that gives a tool speed range of 40 to 10,000 fpm. The 40x48-in. T-slotted table will support work-



pieces of a ton or more. Table stroke is 36 in. Correct feed pressure is automatically controlled by the resistance of the work. The infeed rate is controllable up to 18 fpm with quick return. The machine will cut any ferrous or nonferrous materials that can be machined with standard carbon steel saw bands. *DoAll Co.*

For more data insert No. 25 on postcard, p. 37.

Cargo Loading Device

Mobile conveyer unit is used for handling air and industrial cargo.

A new mobile cargo-handling conveyer unit called Mobiloader consists of a 21-ft conveyer belt mounted on a chassis of standard



Dodge manufacture. The conveyer can be raised or lowered from $5\frac{1}{2}$ to 11 ft by a control lever next to the driver's seat. All controls and operating units are entirely mechanical. The conveyer has a con-

Turn to Page 87



MUSCLE MEN . . . Serving the Nation Well

Judd Barner operates a Lorain Power Shovel for the Dallas County Road Commission, Fordyce, Arkansas. Says Judd: "It is a tough little machine and I enjoy operating it."

Men like Judd Barner who are helping to build a better America know that a machine—like a man—is only as strong as its muscles . . . which, in the case of Judd's shovel, are its fasteners.

To be sure its shovel will withstand the bone-rattling service Judd will give it, The Thew Shovel Company insists upon top-quality fasteners—which pay off in dependable performance out on the job.



John Waring operates a bolt-maker in RB&W's Port Chester plant. Automatic cold-heading, which RB&W originated, accounts for the superior strength, greater accuracy, almost perfect uniformity and improved appearance of RB&W bolts.

Here, and in other manufacturing steps, RB&W builds into its bolts and other fasteners the maximum soundness that enables them to resist the shocks of such service as Judd Barner and his shovel will give them.

Fasteners, which keep a product well-muscled, cost so little compared to the other components . . . isn't it sensible to specify the soundest fasteners?

RB&W

The Complete
Quality Line

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland. Sales agents at: Portland, Seattle. Distributors from coast to coast.

105 Years Making Strong the Things That Make America Strong

IRON AGE

introduces

Lee T. Craig, appointed as vice-president of the **STEEL COMPANY OF CANADA, LTD.**, Hamilton, Ont. Mr. Craig has been associated with the company for the past 30 years. **Harry E. Stipe**, appointed as general sales manager, Western Div.

Samuel D. Richards, named assistant treasurer of **STUDEBAKER CORP.**, South Bend, Ind. Mr. Richards was formerly special assistant to Paul G. Hoffman in the Economic Cooperation Administration.

George W. Marsh, elected an assistant comptroller of **GENERAL ELECTRIC CO.**, Schenectady. **Henry A. Vaughn**, formerly superintendent of the Specialty and Standard Instrument Mfg. Divs., was appointed manager of manufacturing of the Meter and Instrument Divs. Mr. Vaughn succeeds **Herbert L. Ross** who was named manager of the River Works.

Charles G. Eschenbach, appointed assistant director of personnel of **CHRYSLER CORP.**, Detroit. Mr. Eschenbach succeeds the late **C. B. Cornell**.

C. T. Botsford, retiring from the **CHILLICOTHE IRON CO.**, Chillicothe, Mo., Mr. Botsford the founder and owner of the company, leaves after 40 years service.

William J. Hutchinson, Jr., **Clarendon Campbell** and **Jeremiah C. Waterman**, were elected to the board of the **HELICAL TUBE CORP.**, East Orange, N. J. **W. W. McMinn, Jr.**, was appointed assistant secretary-treasurer.

J. E. Vaughn, elected vice-president in charge of sales. **S. L. Beymer**, vice-president and executive assistant to the president, of the **STANDARD RAILWAY EQUIPMENT MFG. CO.**, Hammond, Ind.

W. E. Henges, named vice-president of **GRAYBAR ELECTRIC CO.**, New York. He will continue as assistant to the president.

J. P. Patterson appointed to newly created position of assistant vice-president, freight traffic of **NEW YORK CENTRAL R. R.**, New York. **Arthur E. Baylis**, named general freight traffic manager to succeed Mr. Patterson.

H. C. Coleman, named industry engineering manager, with headquarters at the East Pittsburgh Div., of **WESTINGHOUSE ELECTRIC CORP.** **F. R. Benedict**, was recently assigned new duties with the company's Atomic Power Div.; **S. A. Haverstick**, succeeds Mr. Coleman as manager of the marine and aviation section, industry engineering department.

George W. Willmarth, retires from the **RILEY STOKER CORP.**, Detroit plant, as purchasing agent, after 28 years of service.

John A. Moreland, Jr., appointed manager of the automotive castings sales div., of **HUNT-SPILLER MFG. CORP.**, Boston.

Charles S. DeMuth, assistant treasurer and manager of sales, after 59 years of service with **LYON, CONKLIN & CO., INC.**, Baltimore, is retiring.

Turn to Page 46



RALPH CORDINER, elected president of **General Electric Co.**, Schenectady, N. Y.



WILLIAM L. CAMPBELL, becomes vice-president of **Food Machinery & Chemical Corp.**, San Jose, Calif.



JACK F. WOLFRAM, named general manager **Oldsmobile div.**, of **General Motors Corp.**, Lansing, Mich.

IRON AGE

salutes

Charles E. Wilson



HE is a balanced thinker with a very high sense of social responsibility. For the second time in his career he has resigned a lucrative post as General Electric's top executive to pick up a heavy burden in Washington. Why? Because he was picked as the best man to direct the nation's defense mobilization. In Charlie Wilson's book you don't shirk responsibility—especially when other people are depending on you.

During the early part of World War II President Roosevelt called him to Washington to become vice-chairman of the War Production Board. At that time he commented, "It took me 40 years to climb to the presidency (of GE) and 40 seconds to step out. But Hell's loose and I've got to do something about it." Hell's loose again and Charlie's directing the mobilization to oppose it.

Charlie Wilson has what it takes for the job. Recognized as one of the country's leading production men, he stands out in a generation of assembly line geniuses. He has the respect of top men in industry. And he has the confidence of workers and government.

But not the least of his qualifications are his human qualities. His broad experience and early hard knocks help him know what the other guy is thinking. How he feels. He has the compassion of a good human being. But he demands action—and gets it. He will compromise for the right thing, though not at the sacrifice of principles. He will slash red tape that threatens to snarl production.

Charlie Wilson knows the job he is tackling. He knows there will be plenty of barbs and brickbats. But they won't keep him from doing a good job. The President couldn't have made a better choice.



C. CARLISLE TIPPIT, appointed general purchasing agent of Reliance Electric & Engineering Co., Cleveland.



LEE L. MORGAN, named district representative in New York, Vermont and New Hampshire, Caterpillar Tractor Co., Peoria, Ill.



L. A. WATTS, appointed assistant general sales manager, Wickwire Spencer Steel Div., of the Colorado Fuel & Iron Corp., New York.



RICHARD C. CHRISTIAN, joins the Marsteller Co., Chicago, as senior associate.

IRON AGE *introduces*

Continued

Earl P. Leeds and **James Meehan**, appointed sales directors of the **BROWN & SHARPE MFG. CO.**, Providence.

Almon O. Snyder, appointed factory representative for Ohio, Pennsylvania, West Virginia, Kentucky and Southern Indiana, for **HOSE ACCESSORIES CO.**, Philadelphia. **Arthur W. Gadd**, appointed manufacturers' representative for the states of Missouri, Kansas, Southern Illinois, Western Iowa and Nebraska.

C. H. Keller, appointed acting superintendent, Decatur Div., of **WABASH RAILROAD CO.**, St. Louis.

William G. Mahlman, promoted to sales office manager of **EDWARD VALVES, INC.**, East Chicago, Indiana. He succeeds **Herbert J. Rowe**, who has been called back to the U. S. Marine Corps.

S. C. McCann, appointed sales representative in Kansas and western Missouri for the **NATIONAL RADIATOR CO.**, Johnstown, Pa.

E. D. Buchanan, named superintendent of open hearths at **ALGOMA STEEL CORP., LTD.**, Sault Ste. Marie, Ont.

Russel B. Weil, joined **FRANKLIN METALS CO.**, Newark, N. J., as buyer and seller of metals for the company.

Walter H. Behnke, named manager of the Order and Planning Dept. of the **RELANCE ELECTRIC & ENGINEERING CO.**, Cleveland.

L. W. Smith, appointed district representative for Alabama and part of Tennessee by the **CATERPILLAR TRACTOR CO.**, Peoria, Ill.

John A. Bukowski, appointed general superintendent of **ATLAS FOUNDRY CO.** and **ATLAS STAINLESS STEEL CO.**, Irvington, N. J.

Robert G. Kenly, appointed general sales manager of the **NEW JERSEY ZINC CO.** and the **NEW JERSEY ZINC SALES CO.**, New York. **Ralph M. Neumann** will retire because of his health after 44 years of service.

Jack P. Williams, Jr., appointed a special representative for the mid-west territory of the **SYNCHRO MACHINE CO.**, Perth Amboy, N. J.

James Bruce, elected a director of the **PRESSED STEEL CAR CO., INC.**, Pittsburgh.

Dale S. Gronsdaahl, district representative of eastern sales for eastern Pennsylvania and New Jersey, of the **CATERPILLAR TRACTOR CO.**, Peoria, Ill. **L. W. Smith** replaces Mr. Gronsdaahl as district representative for Alabama and part of Tennessee.

Charles E. Newman, appointed sales engineer for the Chicago territory by **SURFACE COMBUSTION CORP.**

George H. Lynn, appointed general sales manager of the Hamilton Div., **BALDWIN - LIMA - HAMILTON CORP.**, Hamilton, Ohio.

R. M. Wagner, named manager of the Pig Iron and Semi-finished Sales Dept., Wickwire Spencer Steel Div., of **COLORADO FUEL & IRON CORP.**, New York.

Robert J. Eggert appointed manager of marketing research, Ford div., of the **FORD MOTOR CO.**, Dearborn.

Joseph M. Crockett, appointed public relations manager, **FAIRCHILD ENGINE & AIRPLANE CORP.**, New York.

OBITUARIES

Robert A. Currie, 62, export manager for the **Jeffrey Mfg. Co.**, Columbus, died recently.

Jacques Klerekoper, 64, special representative of the Washington office of U. S. Steel Export Co., New York, died Dec. 15.

Clarence Sears Bissell, president of **Black Diamond Coal Mining Co.**, Birmingham, died recently.

Dr. Jacob L. Snoek, 48, head of the Physics Dept. of **Horizons Inc.**, Princeton, N. J., died recently.

John S. Brown, Sr., 63, assistant treasurer of **Jones & Laughlin Steel Corp.**, Pittsburgh, died recently.

Your Ideas may be Better **THAN YOU THINK**

BURIED in most engineering files are design sketches marked: "Good idea but costs too much to make."

Such an idea may be so obvious that many designers have played with it and laid it aside. Or it may be completely new.

The spherical tank for hot water heaters was an obvious idea. It had appealed to several engineers. As compared to all other geometrical forms, for an equal cubical capacity a spherical tank has the least surface to dissipate heat. Its periphery is easy to insulate. It is stress resistant because when under internal pressure its stresses are equal in all directions. But its fabrication problems were difficult and it was laid aside.

When the engineers and metallurgists of Servel Incorporated began serious work on the problems of the spherical tank they found that Revere already had made extensive studies of it.

The alloy had been carefully selected. Herculoy, strong as mild steel, corrosion resistant as copper, high in fatigue strength, easily weldable, ideal for all such applications.

Economical drawing sequences had been worked out. Annealing procedures were ready for obtaining the right tempers for drawing operations and in the finished product.

Servel engineers improved upon all this, added good design features such as the use of a copper tube as a flue, worked with the Revere Research Department to develop the assembly welding methods, fitted all procedures to their own shop conditions, and the spherical tank was ready for production.

The same kind of profitability may be ready and waiting for you.

Get out those "impractical for our production equipment" sketches of yours. Let the Revere Technical Advisors look at them.

Your ideas may be better than you think.

REVERE

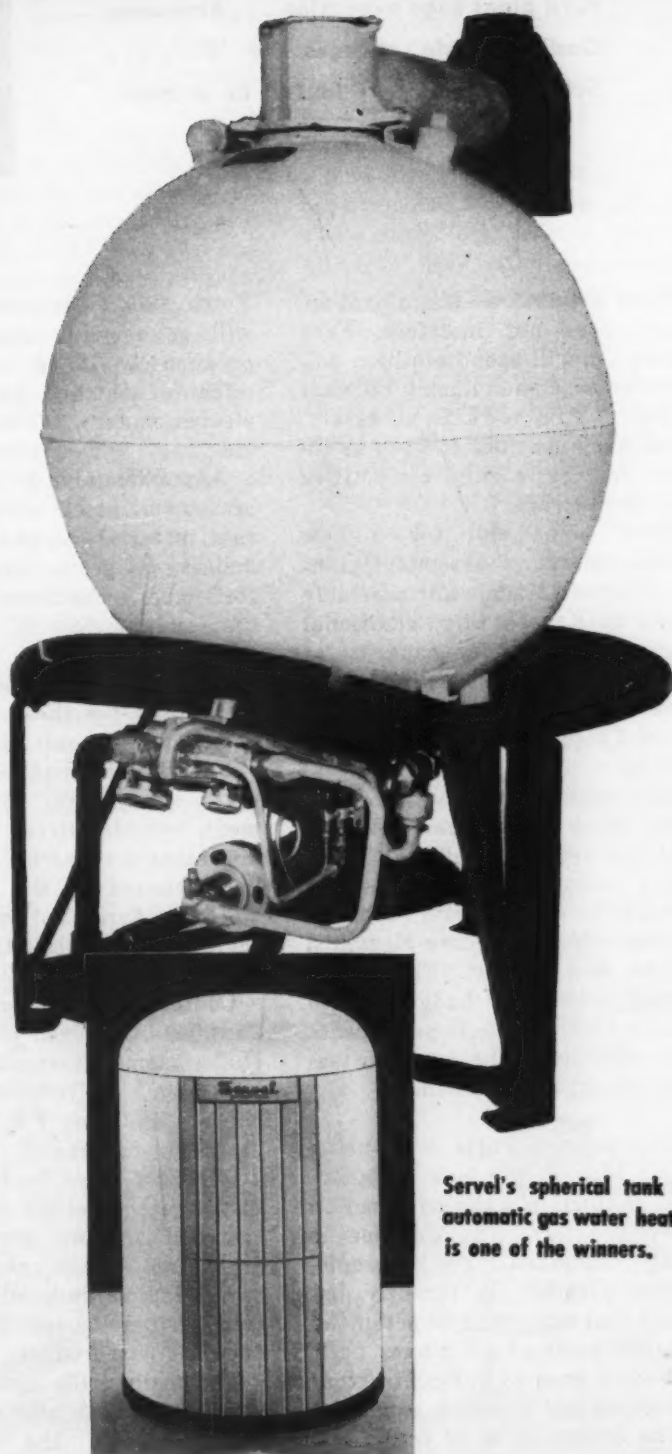
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Servel's spherical tank for automatic gas water heaters is one of the winners.

on the assembly line

automotive
news and
opinions

**Ford plans huge expansion . . . Announce
Cadillac style changes for '51 . . .
Subcontracting big factor in defense.**



by walter g. patton

Ford Expansion—If national defense does not interfere, Ford Motor Co. will spend a billion dollars for expansion during the next 3 years. This work is necessary, Ford explains, just to keep-up-to-date in the highly competitive automotive race.

Ford plans call for a new Lincoln-Mercury assembly plant at Wayne, Mich., an assembly plant at Kansas City, additional engine and foundry capacity at Cleveland and Detroit, a transmission plant at Cincinnati, and pressed steel shops at Buffalo and Detroit.

Extensive changes in the Ford steel, blast furnace and coke operations are also believed to be under consideration. Ford also plans 10 to 12 new parts depots in various cities, including Memphis, Dallas and Detroit. From 1946 through 1950 Ford budgeted \$500 million for plant improvements and expansion. The company actually spent \$600 million.

Sub-contract Parts — During World War II, the bulk of industrial production was performed by sub-contractors. The practice is being continued. For example, Boeing Aircraft Co. recently disclosed that more than 63 pct of the airplane costs of all planes built at Boeing goes to sub-contractors and parts and material suppliers. The figures show 39 pct of Air

Force funds assigned to Boeing will go for sub-assemblies. Approximately 16 pct goes to suppliers of finished parts such as electric motors, valves, oil coolers etc.

Approximately 8 pct goes to aluminum, steel wire and other raw material suppliers. The remaining 37 pct is used by Boeing for labor, facilities, operating costs etc.

Other Plane Costs—Total expenditures for these items, however, represent only about half the value of a finished airplane. Engines, propellers, radar, armament, wheels, tires, instruments and other accessories are normally purchased by the government and then furnished to the manufacturers for installation.

Cadillac Styling — The 1951 Cadillac introduced last week includes some interesting styling refinements. However, bodies, chassis and the V-8 engine are basically unchanged.

Rear and front fenders and the instrument panel are new. A flare-designed bumper gives greater protection. Short chrome-plated bars, sloping outward and down from the new bumper guards, produce the flared effect.

The main grille again has five vertical sections and a grille extension below the headlamps.

Cadillac's upswept tail fin has been redesigned. Back-up lights are incorporated in the rear fender immediately below the tail-lamp.

Other features include a new steering wheel and column, automatic light signals to indicate low oil pressure and generator discharge, and elimination of the starter button.

Changes have been made in the Hydra-Matic to permit split-second changes from forward to reverse gear. The new reverse mechanism permits rocking the car in snow, mud or sand.

When the car is stopped, the control lever can be placed in reverse position to provide a brake which will not permit the car to roll forward or backward even on steep grades. Shock absorber units and front suspension have also been improved.

Changing Market — Automobile marketing experts lay great stress on the changing motor car market. During World War II, for example, it was discovered that 13 million Americans lived in suburbs and relied entirely on automobiles for transportation.

The 1948 Census of Business, the 1950 Census of Housing and the recent population count show further that about four-fifths of the nation's growth in the last 10 years has occurred in the 168 met-

assembly line

Continued

ropolitan areas. The suburbs showed the greatest growth.

Our suburbs, it appears, are now growing two and a half times as fast as the national rate of growth. The rate of growth for central cities is falling short of the national average.

Many Detroit crystal ball gazers think they see in this development an opportunity for increasing the number of 2-car families as well as a substantial increase in the number of car-owning families.

Rubber No Problem—For the present, rubber seems to be relatively unaffected by the defense program. For example, Goodyear Tire & Rubber Co. has recently announced it plans no change in its current program to expand greatly the production of foamed latex.

Goodyear had a large expansion program under way prior to the start of the Korean hostilities. The new capacity was required to meet increasing demands of furniture and automobile manufacturers.

Barring further cutbacks, Goodyear said, the requirements of the furniture industry will continue to be met. It was pointed out, however, that future production plans are subject to immediate change if a large stockpiling program of liquid and dry rubber is undertaken.

Auto Production Cuts—Reports of substantial downward cuts in Detroit auto production schedules continue to come in. The real facts are obscure. Production plans are subject to change from day to day. Nobody knows the score—even at this moment.

It was recently reported a major producer was planning a 10 to 20 pct cutback in January. This reduction will be increased, reaching approximately 30 pct by the end of March. Another major manufacturer is planning an even more severe reduction.

Average Cut 20 Pct—It now seems a fair guess that auto production will be cut on an average

of about 20 pct during the first quarter. It may be assumed, however, that auto manufacturers will continue to assemble just about as many cars as they can get materials to build. Meanwhile, some production will undoubtedly be shifted from service parts to new cars.

Nonessential items like grilles and fenders will be increasingly difficult to obtain but auto manufacturers will continue, as in the past, to make every effort to get back into operation a car that is laid up for want of an essential part.

Truck Prices Stand—Increases in truck prices are not affected by the rollback in passenger car price tags. GMC Truck & Coach Div. has recently announced a boost of from \$50 to \$125 in its light truck line. Corresponding percentage increases have also been made in the medium and heavy duty lines.

Auto Improvements—Many improvements in automobiles are a direct result of intensive research in processes and materials. In its recent report to stockholders Chrysler described some of its latest research tools and methods.

These include a high frequency oscillator used for studying new methods of drying paint more quickly. The same research tool permits faster curing of rubber. This is a development of the familiar electrical equipment employed for almost instantaneous heating of steel.

Chrysler research experts have designed special equipment to help them find better methods of keeping dirt and other foreign particles out of automobile engines. Another valuable Chrysler research tool is the electron microscope which permits magnification up to 100,000 times.

The electron microscope is extensively used by the industry to study metallic structures and the effect of very small particles on properties like corrosion and machinability.

Plans for Planes—John A. McCone, Air Force Undersecretary, said recently that Kaiser-Frazer was studying possibilities of building one type of plane at its Willow Run plant. Ford built Liberators at Willow Run during World War II. Observers expect that the plant will build planes again.

THE BULL OF THE WOODS

By J. R. Williams





"File card" for steel makers

Suppose you, as a manufacturer, wanted to make sure that the steel you ordered today was exactly the same as the steel you ordered months ago, or years ago...

If you are a customer of Kaiser Steel, you have a "file card" similar to the one above...a small ingot of steel taken from every "pour" and kept with its specifications as a permanent record.

This is only one of many scientific methods employed by Kaiser Steel to make sure your needs are met precisely and to assure consistently uniform quality.

Such painstaking care is another reason why the West's only integrated *independent* steel plant is bringing more industry, more jobs, more wealth to the West!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars • carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK

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west coast progress report

*digest of
far west
industrial
activity*

by r.t. reinhardt



Manpower Paradox — Despite semi-critical manpower shortages in some West Coast industries, all major manufacturing areas showed declines in overall employment as the year drew to a close.

Steel fabricators, aircraft manufacturers and ship repair yards and machine shops have recently reported a dearth of skilled men. It is apparent that at the present time manpower is numerically adequate to handle current production demands but that there is a scarcity of skilled workers.

Drop in California — Manufacturing employment in California dropped from the October level of 838,300 to 825,900 in November. Preliminary estimates indicate that a further drop may have occurred during December. Paradoxically, the number of women workers returning to the manufacture of durable goods is reminiscent of the last war.

Aircraft manufacturers have been one of the principal employers although electrical and metalworking establishments have taken their share of the 20,000 women added to the working forces since last June.

Manufacturers' Outlook—Members of the California Manufacturers Assn., representing a considerable cross-section of that state's industry, are not as optimistic over

business prospects as they were 3 months ago.

According to a poll just completed they expect both sales and employment in the first quarter of the new year to run ahead of the first 3 months of 1950 when business was slack and manufacturers' employment was at a postwar low. However they are not so sure about maintaining for the next quarter the currently fast business pace and are uncertain as to their ability to maintain the high level of employment.

Curtail Output — A little more than half of the state's manufacturers indicated that they expected their output the first quarter to be curtailed — 44 pct by materials being controlled and 10 pct by credit restrictions. Twenty-nine pct of these manufacturers expect to reduce their payrolls in the first quarter — 23 pct because of a cut in production due to material shortages and 6 pct because their output will be reduced on account of credit controls.

Manganese Research — Washington State College, with the cooperation of the Bonneville Power Administration, is seeking a method to produce electrolytic manganese dioxide from Northwest ores. Principal objective of the research is to produce highgrade manganese dioxide for use in dry cells of elec-

tric batteries and eliminate this drain on the supply of manganese available for steel production.

An attempt will first be made to improve methods of extracting manganese from Northwest ores and second, development of a commercially feasible method of producing electrolytic manganese dioxide.

The U. S. Bureau of Mines recently announced construction of a proposed \$600,000 pilot plant for treatment of manganese ores at Boulder City, Nev. There is an estimated 50 million tons of low-grade manganese ores in the Artillery Peak area of Arizona.

Whence the Steel?—With steel producers generally, and particularly in the West already devoting a considerable portion of their production to plates for pipe lines, the trade is wondering where the steel is to come from for the construction of new major lines planned.

Two firms are contesting for permission to build a natural gas pipe line from the Four Corners Field in Utah and New Mexico to the Salt Lake industrial area; at least three companies are seeking permits to export gas from Alberta, Canada, to Spokane, Wash., and possibly into Seattle and Portland; and another company is proposing a 1000 mile gas line from Texas to the Pacific Northwest.

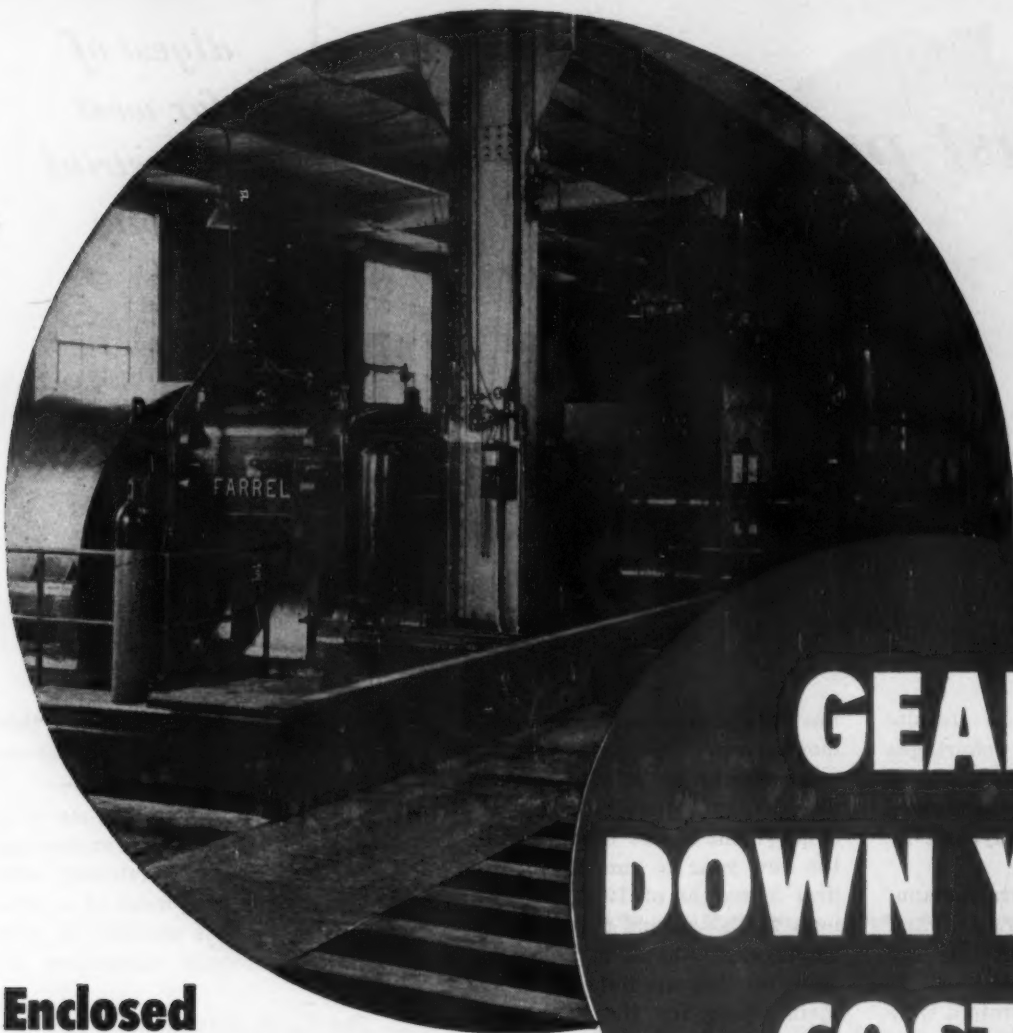


Photo courtesy,
Farrel-Birmingham Co., Inc.
Ansonia, Conn.

GEAR DOWN YOUR COSTS

Enclosed reduction gears run better, last longer, with **TEXACO MEROPA LUBRICANTS**

HERE'LL be no gnashing of teeth when *Texaco Meropa Lubricants* are on the job. These "extreme pressure" lubricants are especially designed to resist the heaviest "squeeze," give gears and bearings full protection . . . assure smoother, quieter operation.

Texaco Meropa Lubricants combat oxidation and thickening, and guard bearings against corrosion. They do not foam, and will not separate in service, storage, or centrifuging. All these benefits add up to greater efficiency, longer gear life and lower maintenance costs.

To assure full protection for your oil film roll necks, use *Texaco Regal Oils*. These famous turbine-grade heavy circulating oils resist oxidation, emulsification and sludging. They keep oil lines clean . . . bearings fully lubricated.

A *Texaco Lubrication Engineer* will gladly show you the way to greater efficiency and economy through effective lubrication. Just call the nearest of the more than 2,000 *Texaco Wholesale Distributing Plants* in the 48 States, or write *The Texas Company*, 135 East 42nd Street, New York 17, N. Y.



TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TEXACO presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

the federal view

*this week in
washington*

by eugene j. hardy



Industrial Info—The Commerce Dept. is expected to announce soon, probably this week, establishment of a clearing house within the department for the screening of industrial information prior to publication.

Not in any way an office of censorship, the unit will serve as a clearing house for inquiries relating to publication of material that might aid an enemy of the United States.

It will not eliminate the necessity for military security clearance of information obtained from military contractors, but the office could be of service in clearing away red tape by setting up general standards for handling such data. The service will be purely voluntary.

Inventory Crackdown—Reports of excessive inventories held by some companies are prompting the National Production Authority to tighten enforcement of its inventory regulation—(NPA Reg. 1).

The agency has thus far done little to obtain compliance with its inventory order since it was put into effect nearly 3 months ago, but the volume of complaints rolling into the control agency now indicates a crack-down is in the offing.

Recently, NPA sent an inventory questionnaire to 300 firms

asking information on inventories held before and after issuance of the control order. As expected, the majority of firms reported declines, particularly in inventories of metals.

Have Not Replied—But a number of firms have not replied to the questionnaire. Their failure to respond has raised the question of compliance, in the eyes of NPA officials. Manly Fleischman, NPA general counsel, declares "we're going to make them report."

Just how NPA is going to "make them report" is not disclosed by NPA officials, but it is a sure bet strict enforcement is now not far off.

War Damage Insurance—Business firms as well as individuals soon will be able to insure plant, equipment and other property against destruction by an enemy force.

The House of Representatives already has given its approval to legislation authorizing the Reconstruction Finance Corp. To supply \$1 billion in insurance-writing capital to the War Damage Corp.

Actual underwriting would be conducted by private property insurance companies.

Includes A-Bomb Damage—War Damage Corp. was in existence during World War II, but did very

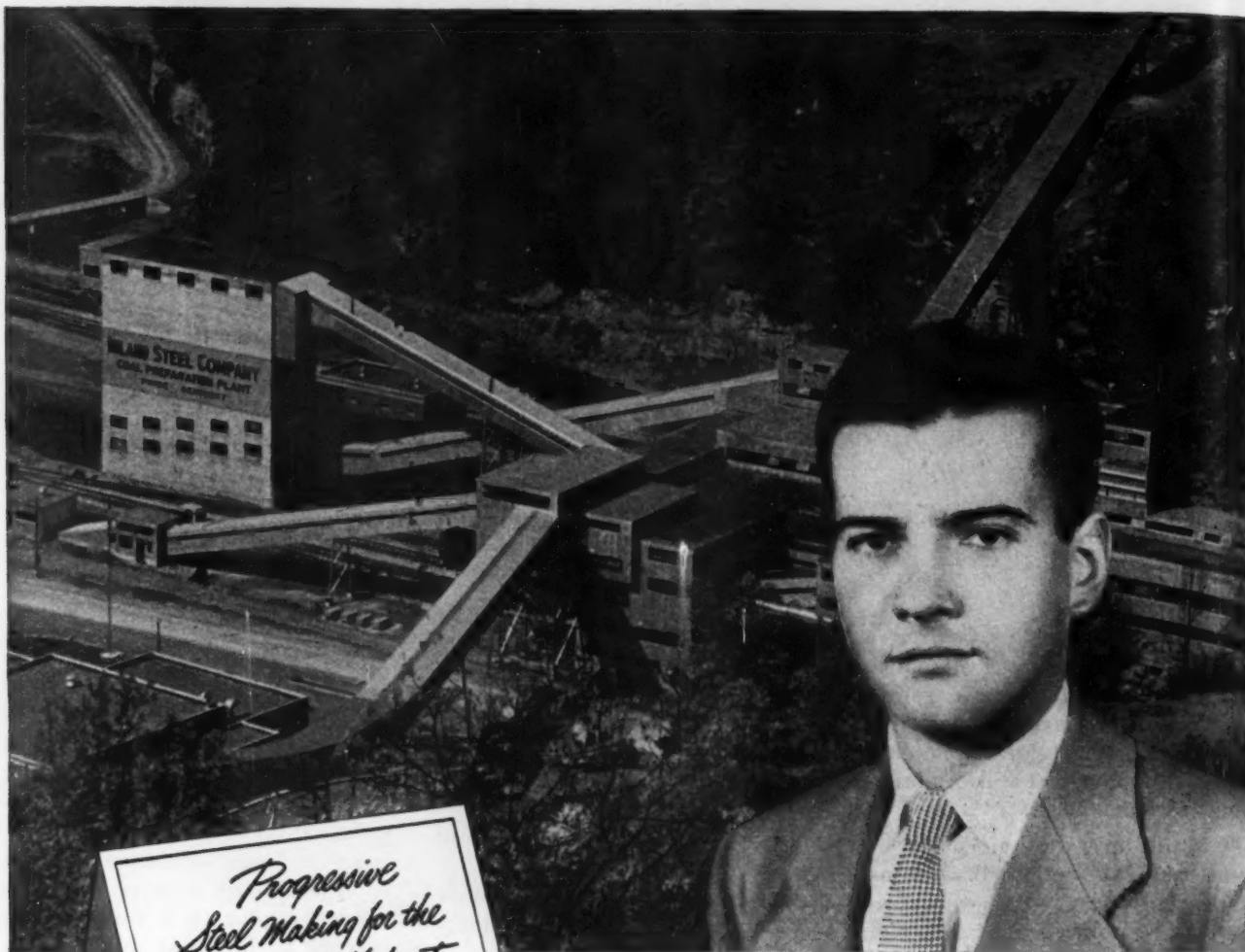
little business for obvious reasons. The General feeling in congress is that the U. S. may not be as lucky in the future. Considerable demand for war damage insurance is evidenced in congressional mail, and so far, no private insurance company is willing to assume the untold liability involved in writing such policies.

Present plans call for such insurance to be made available to any citizen or business firm for damage sustained because of enemy action within continental limits of the United States, including destruction due to an atomic bomb.

CMP from Military—Munition board procurement officials have worked out an outline for a controlled materials plan about identical to that WPB operated during World War II

This is probably only one of many plans which ODM Director Charles E. Wilson will have to consider, but military concurrence in the need for CMP brings the institution of such a plan one step closer.

Seaway Up Again—The new Congress will take another look at the St. Lawrence Seaway project this year. Defense aspects of the project will highlight arguments of its backers notably direct transportation of the Quebec-Labrador Iron Ore to the Midwest steel industry.



*Progressive
Steel Making for the
Industrial Midwest*

"WE GIVE OUR COAL A BATH to improve our steel!"

"I'm Dick Jimenez, Preparation Engineer at Inland's new coal preparation plant in Price, Kentucky. Our job here is to provide a clean, uniform grade of coal with a low ash content for the Inland coke ovens. Poor coal... coal with varying degrees of slate mixed in... results in inefficient and undependable blast furnace operation. And today it's more important than ever that those blast

furnaces be as productive as possible."

This coal preparation plant was recently put into operation as part of Inland's continuing program of modernization and expansion. This constant improvement of every phase of steel-making is further evidence that Midwest steel users can put their confidence in Inland as a progressive and dependable source of steel in peace and war.



Products: Sheets, Strips, Tin Mill Products, Bars, Plates, Structural Shapes, Sheet Piling, Reinforcing Bars, Pig Iron, Rails and Track Accessories, Coal Chemicals.

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RUBBER GOODS

What Metalworking Needs and Will Get

By OLIVER L. JOHNSON, *Director of Research, THE IRON AGE*

HOW much harder is it going to be to buy new or replacement mechanical rubber goods? One out of every ten pounds of rubber produced in this country is made into hose, power transmission or conveyer belting or sheet and molded rubber. According to a survey recently completed by the Market Research Division of THE IRON AGE, the metalworking industry's bill for mechanical rubber goods in 1950 will amount to more than \$94 million (Table 1), exclusive of automotive plants.

The survey was based on a questionnaire filled out by 1141 plants, of whom 1103 are users of mechanical rubber goods in their plants and equipment, their products or both.

The reporting plants provide a representative cross-section of the metalworking industry, as indicated in Table 2. The purpose of the survey was to get reliable information on present consumption of rubber by the industry.

Everyone Needed Consumption Figures

Such information was needed by governmental agencies, the rubber manufacturers and the metal-producing and metalworking industries themselves. It is particularly important in view of present armament programs. Already, with only partial industrial mobilization, there are clear indications that greater quantities of mechanical rubber goods will be used

An IRON AGE survey shows that the metalworking industry is spending over \$94 million a year for mechanical rubber goods. Even greater consumption is expected in 1951. The growing natural rubber stockpile and reactivated synthetic plants should be able to meet all essential demands.

Mechanical Rubber Goods

Continued

in 1951 (see Table 3). Recent accelerated defense spending will add further to these totals.

That makes the next question: Can the supply of these rubber products meet such increased demands? The answer depends on the general rubber situation, including present and potential imports of natural rubber, the national stockpile and the country's synthetic rubber production facilities.

A growing stockpile of natural rubber exists

today, along with NPA orders limiting the consumption of this material in non-military products. During November, manufacturers were limited to 75 pct of the amount of natural rubber they used in the same month of the base period ended June 30, 1950. For December, this rate of consumption was cut to 28 pct.

Synthetic Plants Being Reactivated

In addition to this stockpile of natural rubber, there are the wartime-developed facilities for the production of synthetic rubber. With the standby plants which are due to be back in production during the first half of 1951,

TABLE I MECHANICAL RUBBER GOODS USED BY THE METALWORKING INDUSTRY IN 1950*

Govt. Ind. Code	Description of Industry Groups	Total Mechanical Rubber Goods	Hose	Conveyor Belts	Flat Belts	Rubber V-Belts	Milled and Extruded Rubber	Sheet Rubber	Other Mechanical Rubber	Un-Itemized Purchases not Expanded
25	METAL FURNITURE	\$570,555	\$103,958	\$6,632	\$4,236	\$26,604	\$498,169	\$3,741	\$12,315	\$4,951
331	Steelworks and Rolling Mills	\$2,709,021	\$1,041,353	\$738,024	\$89,089	\$421,016	\$41,424	\$136,901	\$241,214	
332	Iron and Steel Foundries	\$1,575,747	\$357,145	\$726,048	\$67,354	\$159,605	\$37,472	\$49,577	\$18,496	\$158,093
333-4	Nonferrous Smelting	\$1,621,035	\$236,793	\$987,991	\$41,290	\$73,456	\$28,287	\$103,570	\$149,648	
335	Nonferrous Rolling Mills	\$242,091	\$126,525	\$4,981	\$10,959	\$29,888	\$45,828	\$11,955	\$11,955	
336	Nonferrous Foundries	\$453,799	\$127,917	\$278,433	\$6,396	\$21,319	\$7,675	\$3,637	\$6,822	\$1,400
339	Misc. Primary Metal	\$496,809	\$222,669	\$11,494	\$3,430	\$110,480	\$23,513	\$25,313	\$96,910	\$5,000
33	PRIMARY METALS	\$7,100,502	\$2,112,402	\$2,748,971	\$218,518	\$815,764	\$184,199	\$331,153	\$525,045	\$164,430
341	Tin Cans and Tinware	\$118,571	\$13,270	\$17,122	\$5,565	\$14,126	\$42,377	\$10,701	\$15,410	
342	Cutlery, Hand Tools and Hardware	\$542,676	\$75,708	\$41,283	\$16,016	\$62,954	\$156,837	\$15,506	\$19,822	\$154,590
343	Heating and Plumbing Equip.	\$1,774,151	\$238,992	\$14,699	\$10,569	\$397,181	\$639,575	\$19,359	\$352,078	\$1,700
344	Fabricated Structural Products	\$1,806,141	\$773,220	\$46,633	\$7,094	\$188,563	\$173,161	\$403,316	\$198,529	\$15,825
346	Metal Stamping	\$1,400,222	\$240,097	\$49,295	\$20,613	\$91,150	\$770,464	\$123,851	\$103,842	\$900
347	Lighting Fixtures	\$43,580	\$8,269	\$4,693		\$8,299	\$16,782	\$5,597		
348	Fabricated Wire Products	\$518,644	\$103,841	\$30,187	\$19,720	\$64,001	\$180,294	\$931		
349	Misc. Fabricated Metal Products	\$350,857	\$100,033	\$9,127	\$1,505	\$44,617	\$117,963	\$3,232	\$74,393	
34	FABRICATED METAL PRODUCTS	\$6,554,842	\$1,553,130	\$3,304,9	\$201,082	\$870,661	\$2,097,423	\$582,463	\$784,059	\$172,775
351	Engines and Turbines	\$1,094,119	\$222,091	\$25,606	\$485	\$56,581	\$312,093	\$9,232	\$419,071	
352	Agricultural Machy. and Tractors	\$11,198,563	\$2,005,257	\$3,177,951	\$209,505	\$4,033,520	\$1,054,694	\$38,243	\$374,348	\$135,038
353	Construction and Mining Equip.	\$4,322,286	\$1,284,958	\$1,189,678	\$169,133	\$675,695	\$473,511	\$19,590	\$16,613	\$215,000
354	Metalworking Machinery	\$1,711,119	\$363,999	\$78,339	\$5,201	\$423,082	\$78,090	\$38,643	\$385,905	\$37,800
355	Special Industry Machinery	\$2,912,245	\$393,067	\$467,444	\$212,172	\$695,011	\$852,881	\$74,447	\$203,723	\$13,500
356	General Industrial Machinery	\$6,777,610	\$958,945	\$2,638,854	\$6,543	\$1,189,986	\$1,822,112	\$143,101	\$193,089	\$225,000
357	Office and Store Machines	\$5,537,719	\$41,499	\$24,089	\$2,472	\$34,742	\$3,505,227	\$1,835,629	\$43,881	\$50,000
358	Household Machines	\$21,463,016	\$5,516,601	\$483,514	\$81,430	\$3,061,154	\$11,782,692	\$133,025	\$294,600	\$130,000
359	Misc. Machinery Parts	\$2,597,363	\$444,944	\$78,121	\$3,587	\$221,759	\$1,701,214	\$78,291	\$68,647	\$800
35	MACHINERY	\$57,614,042	\$11,611,361	\$8,203,796	\$690,508	\$10,393,510	\$21,292,514	\$2,490,317	\$2,226,897	\$805,139
361	Elec. Wiring and Industrial Equip.	\$3,664,072	\$247,484	\$92,815	\$2,334	\$116,564	\$2,064,562	\$120,511	\$119,282	\$300
362	Elec. Appliances, Not Elsewhere Classified	\$255,295	\$6,577		\$41,852	\$14,947	\$172,189		\$19,730	
364	Elec. Equipment for Transportation Equipment	\$722,515	\$87,802			\$82,807	\$448,623	\$22,431	\$100,852	
366	Communication Equipment	\$2,081,371	\$252,745	\$6,901	\$89,711	\$93,516	\$1,015,356	\$477,012	\$146,130	
369	Misc. Electrical Products	\$71,596	\$22,753			\$9,809	\$11,401	\$13,902	\$13,733	
36	ELECTRICAL EQUIPMENT	\$6,794,851	\$817,361	\$99,716	\$133,897	\$297,643	\$4,612,151	\$633,856	\$399,727	\$500
3714-16	Motor Vehicle Parts and Trailers	\$4,573,628	\$566,845	\$320,960	\$7,378	\$446,547	\$2,090,309	\$97,147	\$1,032,442	\$12,000
372	Aircraft and Parts	\$3,370,991	\$608,025		\$2,586	\$110,671	\$1,118,221	\$616,290	\$815,218	\$100,000
373	Shipbuilding	\$1,523,006	\$570,300	\$99,390		\$59,938	\$245,608	\$316,705	\$231,065	
374	Railroad Equipment	\$2,229,018	\$672,786	\$15,162		\$734,933	\$464,826	\$22,743	\$318,518	
375	Motorcycles and Bicycles	\$108,043	\$3,230			\$4,307	\$100,506			
37	TRANSPORTATION EQUIPMENT	\$11,804,686	\$2,421,185	\$435,512	\$9,944	\$1,356,446	\$4,019,470	\$1,052,085	\$2,397,243	\$112,000
381-2	Mech. Control Instruments	\$1,571,677	\$105,658	\$1,682		\$9,250	\$1,303,488	\$44,891	\$94,608	\$12,000
383-7	Other Instruments	\$370,555	\$66,072	\$605	\$25,759	\$86,688	\$117,132	\$31,602	\$42,717	
38	INSTRUMENTS	\$1,942,232	\$171,730	\$2,287	\$25,759	\$95,918	\$1,420,620	\$76,593	\$137,325	\$12,000
391-5	Jewelry and Silverware	\$119,080	\$43,158	\$4,149	\$2,074	\$62,261		\$6,351		\$1,087
3943	Children's Vehicles	\$1,509,667	\$3,203			\$2,016	\$1,504,448			
39 BAL.	Balance of 39 Group	\$312,458	\$36,244			\$24,173	\$183,846	\$21,000	\$46,945	\$290
39	MISC. MFG. (METAL)	\$1,841,205	\$82,605	\$4,149	\$2,074	\$88,460	\$1,688,294	\$27,351	\$46,945	\$1,337
	Purchases of Metalworking Industry, Based on Expansion of the Sample	\$94,322,915	\$18,573,743	\$11,814,112	\$1,286,018	\$13,945,196	\$35,722,780	\$5,198,359	\$6,609,656	\$1,273,161

*Exclusive of manufacturers of motor vehicles & bodies.

TABLE II

ANALYSIS OF THE SAMPLE

Total Sample Includes Reports From 1141 Plants.
Annual Dollar Purchases Based on 811 Plants

Govt. Ind. Code	Description of Industry Groups	Number Plants Reporting	Number Plants Using Rubber	Number Workers in Reporting Plants	Total Workers in These Industry Groups	Pct. Coverage by Sample	Number Plants Reporting Dollar Purchases	Rubber Purchases by 811 Plants
25	Metal Furniture.....	28	27	12,875	77,257	18.7	28	\$103,070
33	Primary Metals.....	190	187	104,467	1,010,055	10.3	137	\$902,283
34	Fabricated Metal Products.....	257	243	90,535	822,514	11.0	183	\$780,603
35	Machinery Manufacturers.....	382	374	202,282	1,287,108	15.6	276	\$9,781,014
36	Electrical Equipment.....	87	82	74,830	639,147	11.7	55	\$511,470
37	Transportation Equipment.....	116	114	184,485	987,142	16.6	75	\$14,218,235
38	Instruments.....	33	31	24,798	162,487	15.2	28	\$513,640
39	Misc. Metal Manufacturing.....	48	45	28,422	165,415	16.0	33	\$916,102
	Sample Totals.....	1141	1103	700,644	5,161,093	13.6	811	\$27,726,397

over 920,000 long tons of synthetic are expected to be produced annually. This projected production figure is, of course, highly sensitive to the flow of raw materials to these reactivated plants.

At present, a typical average figure for the natural rubber content in compounds intended for civilian consumption is around 40 pct. The proportion of natural in almost all such rubber goods can be reduced considerably if necessary.

All this means that the outlook for the metalworking industry's supply of mechanical rubber goods is favorable. As in the last war, those manufacturers and suppliers whose production is largely a part of the armament programs are assured of adequate belting, hose, sheet and other necessary rubber items.

How Data Were Established

To establish a yearly dollar rate of consumption of mechanical rubber goods by the metalworking industry, questionnaires were sent to 6000 plants, in all of the industry's groupings. Returns were received from 1141 plants, representing a 19 pct response. These plants employ 700,644 production workers. A comparison of this figure with the total employed by metalworking companies shows that it represents 13.6 pct of the industry's total working force. The survey sample of 1141, when compared with the number of plants in the industry as a whole, represents a like percentage.

Of the 1103 plants who reported that they do use mechanical rubber goods, 811 were able to give dollar figures representing their consumption of these products. It is the questionnaires from these 811 plants that the figures in Table 1 are based on.

Since the sample on which surveys such as this are based are only a part of the whole, it was necessary to find a way to expand the results so that the consumption of mechanical rubber goods by the entire metalworking industry could be determined. The method used is

based on a per capita dollar purchase figure, based on one production worker. This is a standard method of determining such information, as it is known that industrial buying power follows the same pattern as production worker employment.

Automotive Industry Excluded

Even though the manufacturers of automobiles, trucks and buses are an important part of the metalworking industry they were excluded from the survey. The needs of these plants for tires, hose, V-belts, extruded and molded items and other rubber goods are well known, both to the automotive companies and the rubber industry itself.

To keep the results of the survey on a conservative basis, plants employing less than 50 workers were also excluded. Sometimes a high usage factor developed in one or another of the 150 industry groups included in the survey. Whenever this occurred, the individual responses in such groups were examined to see if the high figure was typical of the group or if it was caused by a single report that did not conform to the group pattern. In some such cases, the usage factor was adjusted downward.

TABLE III THE BUYING TREND

Type of Mechanical Rubber Goods	Number Replying to Question	Will Use More		Will Use Same Amount		Will Use Less	
		No.	Pct.	No.	Pct.	No.	Pct.
Hose.....	408	209	51	131	32	68	17
Conveyor Belting	140	87	48	37	26	36	26
Flat Transmission							
Belts.....	88	35	40	31	35	22	25
V-Belts.....	388	212	55	123	32	53	13
Molded and Ex-							
truded Rubber...	256	161	63	61	24	34	13
Sheet Rubber.....	208	108	52	71	34	29	14
Other Mechanical							
Rubber Goods...	219	128	58	59	27	32	15

Water vapor in heat treating furnaces has a surprising embrittling effect on steel. The "hydrogen potential" of steam contacting steel at elevated temperatures exceeds the potential of pure hydrogen itself under theoretical pressures of hundreds or even thousands of atmospheres.

HOW FURNACE MOISTURE Causes Embrittlement

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CLOSE to a century ago, steel was introduced as a new material for boiler construction. This was a great advance, but it brought with it an outstanding problem which cannot yet be said to be completely controlled. The problem of boiler embrittlement has led to countless explosions and loss of human lives.

Seven years ago the author presented before the ASME a historical review and metallurgical study of embrittlement in steam boilers¹. This study described from both theoretical and experimental standpoints the development of boiler embrittlement as a hydrogen-caused phenomenon—specifically one in which hydrogen (a) diffuses into the body of the metal due to appropriate external hydrogenizing conditions, (b) reacts with nonmetallic constituents, such as carbon, and (c) produces entrapped occlusions of insoluble gases whose triaxial compression develops the described condition of embrittlement.

Following the theory suggested in that paper, the thermodynamic principles of gas-metal reactions were studied in more detail, particularly with regard to the reaction between steam and ferrous materials. A remarkable fact emerged: it was readily shown that the hydrogen potential² of steam contacting steel at elevated temperatures frequently exceeds the potential of pure hydrogen itself under theoretical pressures of hundreds and even thousands of atmospheres.

That is, so far as an ability to inject hydrogen

into steel is concerned, steam is often far more powerful than hydrogen itself. Recognition of this fact has now become rather common for melting and welding processes, but its importance in ranges of the solid state remains unexplored, with the stated exception for boiler embrittlement.

H₂ Potential Confirmed

To test the theory experimentally, a special bend test was devised³; this was applied to a measurement of the bendability of a number of steels heat treated according to commercial practice, but in a laboratory furnace. With the standard bendabilities thus defined for normal practice, these same steels were next heat treated under identical conditions, except that the atmosphere of the heat treating furnace was varied with respect to its content of water vapor.

The results of these tests directly confirmed the theory of the hydrogen potential in steam-metal reactions. This will astonish the heat treating industry, for hydrogen embrittlement from a steam-metal reaction during processing has scarcely if ever been considered, and certainly not to the degree now shown.

Two types of hydrogen embrittlement must be carefully distinguished: (1) intracrystalline planar-pressure embrittlement—such as pickling brittleness—caused by precipitation of elemental hydrogen along crystallographic planes within

the body of the grain, and (2) intercrystalline embrittlement—such as boiler embrittlement and hydrogen attack—caused by accumulation of gaseous hydrogen reaction products in grain boundaries. The first is a short-time and somewhat reversible phenomenon, whereas the second is a long-time one, involved in service problems rather than in heat treating. The latter as a result of the steam-metal reaction has been touched upon by H. T. Solberg and his associates in discussing high-temperature corrosion. The present study primarily concerns the intracrystalline type of embrittlement.

Atmospheres Varied

To clarify the role of H_2O , three classifications of furnace atmosphere will be considered: (1) carefully dried helium, (2) ordinary air, and (3) steam at one atmosphere pressure. The first of these will provide a reference condition in which the bendability values refer directly to properties of the steel itself. The second, ordinary air, will provide bendabilities indicative of common commercial practice. The third condition serves somewhat as a maximum limit for the effect, although local surface conditions must frequently occur in which PH_2O considerably exceeds one atmosphere.

In Fig. 1, the bendability values are plotted for type 414 stainless steel hardened over a range of temperature, and in three series of tests as indicated⁴. Data for this particular grade have special interest for plants handling stainless steel, because type 414 is known to be sensitive to hydrogen embrittlement. Bright-annealing atmospheres containing hydrogen cannot be used in its treatment without encountering a serious threat from embrittlement.

In the bendability plots, bend values are listed vertically along the ordinate at the left from zero to a full bend of 180°. This full bend does not mean zero embrittlement, but is simply a limit for the sensitivity of the test. Fig. 1 shows the steel sustaining a full bend at all hardening temperatures up to 1000°C (1832°F), but losing this after hardening at higher temperatures; the bendability drops to values of around 40° or 50°. The same steel heat treated in an ordinary atmosphere displayed embrittlement at hardening temperatures as low as 900°C (1682°F).

Steam Causes Failures

When the furnace was flushed with steam at one atmosphere pressure, the specimens then failed over the entire hardening range down to 800°C (1472°F). For hardening temperatures in the commercial range around 1000°C, the metal attained a virtually glasslike condition, fracturing at angles near 10°. The several areas in Fig. 1 are shaded to depict visually the loss in ductility caused by the nature of the steel itself, water vapor present as normal humidity in the air, and steam. These are important differences,

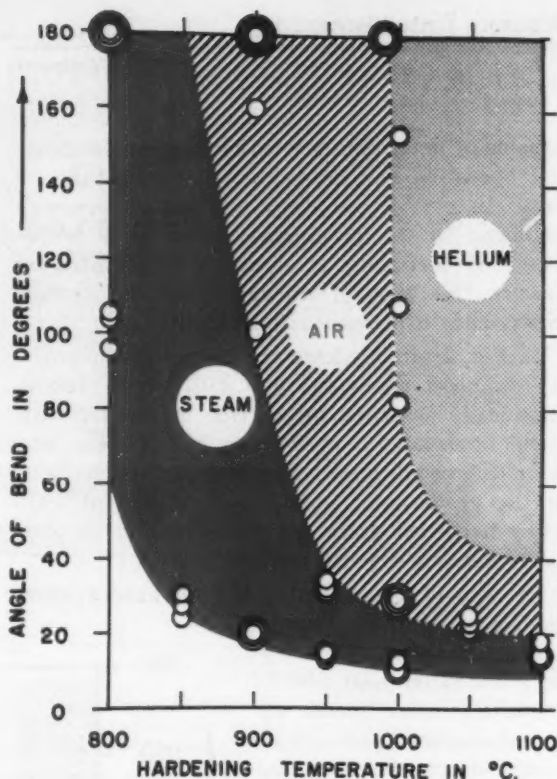


FIG. 1—Bend values for $\frac{1}{4}$ -in. bar of type 414 stainless steel, hardened from various temperatures in three series of tests utilizing different moisture contents of the furnace atmosphere.

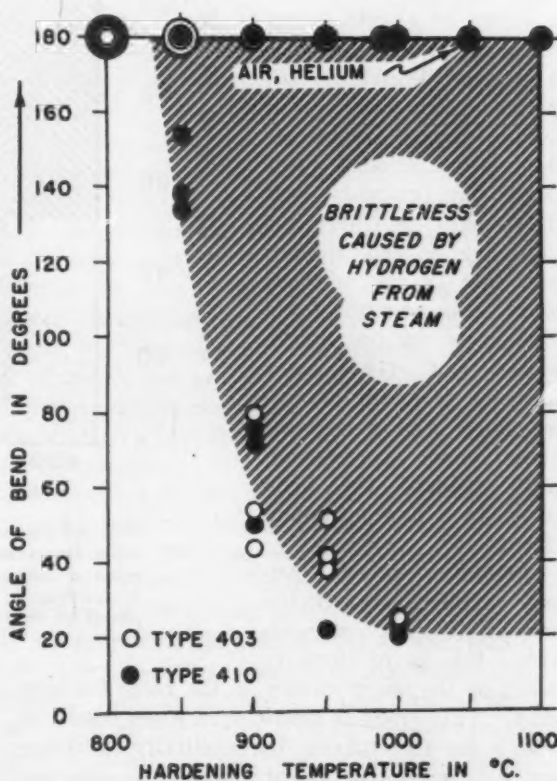


FIG. 2—Bend values for types 403 and 410 stainless steel, treated as in Fig. 1.

Continued

capable of determining whether a given fabricating operation can be conducted successfully or not. In every case, they add an unnecessary handicap to the processing of an alloy whose range of usefulness is already often limited by exactly this type of difficulty—lack of formability, here expressed as bendability.

In Fig. 2, similar tests are applied to the popular stainless types 403 and 410. Type 403 is specifically designed for service in contact with steam at elevated temperatures, giving these data an added significance. The plot shows that both of the grades will sustain a full bend of 180° when hardened from any temperature, so long as a relatively dry atmosphere is used.

By way of great contrast, both grades show failure beginning at hardening temperatures in a very low range near 850°C (1562°F) when steam at one atmosphere pressure is admitted to the furnace. At temperatures of full-hardening, embrittlement is extremely severe, causing failure at angles of only 20°.

In Fig. 3, a summary of results for several different grades of stainless steel is shown by shaded areas. These depict the difference in average bendability for treatments in dried air or helium versus treatments in one atmosphere of water vapor⁵. The particular heat of type 410 used here had a higher carbon content than that in the previous figure; this accounts for a bendability in the neighborhood of 110° when hardened from the dry atmosphere. The presence of water vapor correspondingly reduced the bend values to a new minimum of only 10°.

Increasing carbon content rapidly increases the susceptibility to hydrogenizing; this is particularly shown by the short column on the right for type 440-C. This grade is brittle even when hardened from a dry atmosphere; its sensitivity to hydrogen is so great that slight amounts of moisture further reduce the bendability until a virtually glasslike condition is attained.

Bend values for type 430 are also shown. They are particularly interesting because of the wide use of this steel, and because it strictly belongs to the Class II grades⁶ which are not fully hardenable. The full bend for hardening from dry atmospheres is reduced to values less than 60° when steam is admitted to the furnace.

H₂ Potential Explained

The explanation for this phenomenal behavior stands in the theory of the hydrogen potential of metal-steam reactions². There is a commercial process for producing hydrogen which involves the oxidation of iron by steam: $x\text{Fe} + y\text{H}_2\text{O} \rightarrow \text{Fe}_x\text{O}_y + y\text{H}_2$. There is similarly a prominent reaction utilized in the gaseous reduction of iron ore by hydrogen⁷: $y\text{H}_2 + \text{Fe}_x\text{O}_y \rightarrow x\text{Fe} + y\text{H}_2\text{O}$. The combination of these two reactions provides an equilibrium expressed as follows: $x\text{Fe} + y\text{H}_2\text{O} = \text{Fe}_x\text{O}_y + y\text{H}_2$. The subscripts x and y simply refer to unidentified proportions and permit the equation to be used generally for any given oxide.

Each of the individual reactions has been rather carefully studied, and over a wide temperature range; it is possible to calculate the thermodynamic values for any one of the components under a wide range of conditions. For pure iron, the data are particularly well known; and in Fig. 4 the physico-chemical conditions regarding H₂O and H₂ are outlined for iron reacting with one atmosphere steam over a temperature range extending from tempering operations for steel on up to the melting point. These calculations are straightforward and relatively easy to make, depending simply upon known proportions of H₂/H₂O which are necessary for an equilibrium between the first two equations, oxidation of the metal to form oxide, and reduction of the oxide.

With the pressure of H₂O fixed at one atmosphere the proportion of

H₂/H₂O indicates that equilibrium pressure of hydrogen would theoretically be necessary in combination with the one atmosphere of H₂O to provide a condition of equilibrium.

If one were actually to introduce one atmosphere of steam into a closed bomb containing

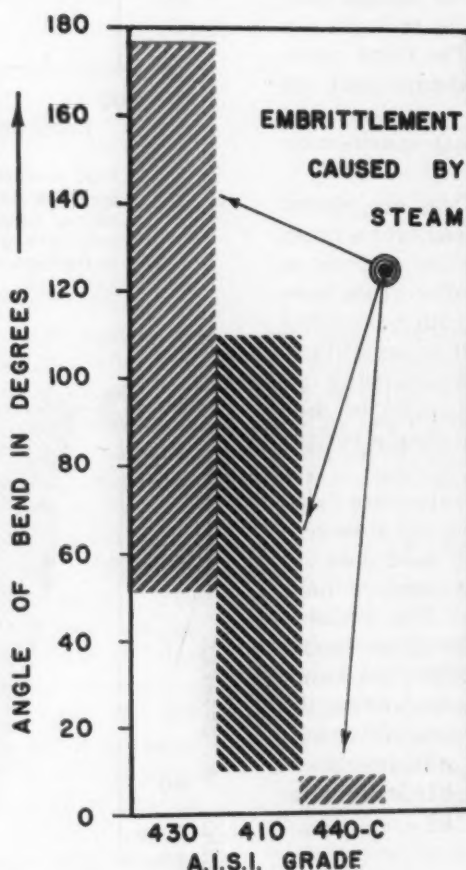


FIG. 3—Diagram of bendability limits for several stainless steels given a full-hardening treatment in contrasting furnace atmospheres of steam and dry air.

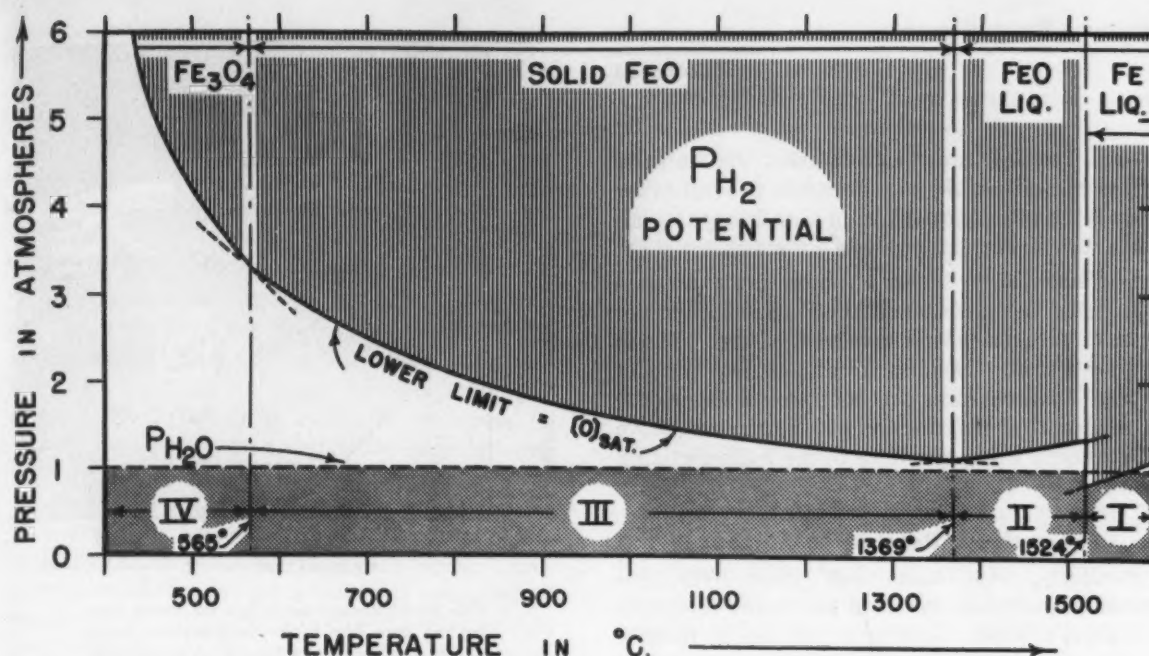


FIG. 4—Calculations of the hydrogen potential for steam at one atmosphere pressure contacting pure iron saturated with oxygen. The hydrogen potential is the underboundary of the curve rising to the left. The upper shaded area indicates the hydrogen potentials for irons and steels having lesser oxygen pressures.

iron, hydrogen would be developed in accord with the first equation until its pressure reached the value shown by the lower limit of the upper shaded area in Fig. 4—neglecting certain corrections for fugacity coefficients which in no wise invalidate the argument. The theory of the hydrogen potential then proposes that essentially such conditions obtain at the exact microsurface where steam-metal reaction takes place. The H_2O generates nascent or atomic hydrogen at the instant of its reaction with the metal; and the infusion of this hydrogen into the metal follows a direct relationship with the surfacial condition, and only an indirect relationship to gas conditions in removed porticas of the atmosphere.

Steam Worse Than Pure H_2

Over the entire temperature range under consideration in Fig. 4, the hydrogenizing power of steam is greater than the hydrogenizing power of an equal pressure of pure hydrogen itself. There is an early dip in the curve at temperatures adjoining the melting point; but throughout the range the hydrogen potential steadily increases as the temperature is lowered, attaining values of several atmospheres in the neighborhood of common tempering treatments.

Furthermore, these values are absolute minimums for most ferrous systems. They are calculated for a condition of pure iron saturated with oxygen. Virtually every commercial problem concerns steels having far lower oxygen pressures, hence far higher hydrogen pressures. The upper shaded area in Fig. 4 expresses this fact. Detailed consideration of the matter is contained

in the original paper², but Fig. 5 will suffice to carry the point. Calculated hydrogen potentials are sketched for a number of common alloy additions to iron and steel. Temperatures are in the melting range, but one will note that the slopes of most of the curves proceed to even higher hydrogen pressures at lower temperatures.

In Fig. 5, the underboundary of the shaded area is for $P =$ one atmosphere, the pressure of the H_2O . Values from Fig. 4 for iron are extended into the melting range, and the hydrogen potential remains near a 1:1 relationship with H_2O . For chromium, however, contact with one atmosphere of steam produces hydrogen with a potential in the neighborhood of 100 atmospheres. Manganese and silicon lie in still higher ranges of thousands of atmospheres. Topping all of the curves are the calculations for aluminum and magnesium, whose theoretical hydrogen potentials run into the millions and even billions of atmospheres.

While these figures sound fantastic, they are quite appropriate, highly informative, and not uncommon in thermodynamic calculations. In reality, a behavior of hydrogen atoms is being considered, rather than molecules; pressures of H_2 are only used for convenience of expression. Everyone can picture tank hydrogen under high pressure, but to picture the ductility of steel ruined by contact with 0.000000000001 atmosphere of atomic H is difficult. The infinitesimal proportion of atomic to molecular hydrogen— H/H_2 —in thermal equilibrium at the temperatures in question is responsible for the many

zeros. The data are far from exact; but in spite of the corrections they invite, their general order is qualitatively appropriate in signifying the important hydrogenizing power of steam.

For example, in the magnesium and aluminum industries the metal cannot be cast successfully unless hydrogen is first removed. There the gas is known to be picked up from moisture; the plot in Fig. 5 corroborates this commercial experience in designating magnesium and aluminum above all others as being sensitive to the hydrogenizing effect of H_2O .

Gassiness Related to Silicon

Similarly, wild heats and other hydrogen-caused phenomena can often be related to silicon additions to steel. Gassiness in Class II ferritic stainless steels⁶ is a prominent characteristic undoubtedly contributed by the chromium content; hydrogen problems with vitreous enamel can follow from reaction of the metal with H_2O in the bisque. Both nickel and copper lie at hydrogen proportions much less than unity. Gassiness in these metals and their alloys is accordingly not due to elemental hydrogen; it results from secondary reactions of this gas with other non-metallics to provide insoluble products whose

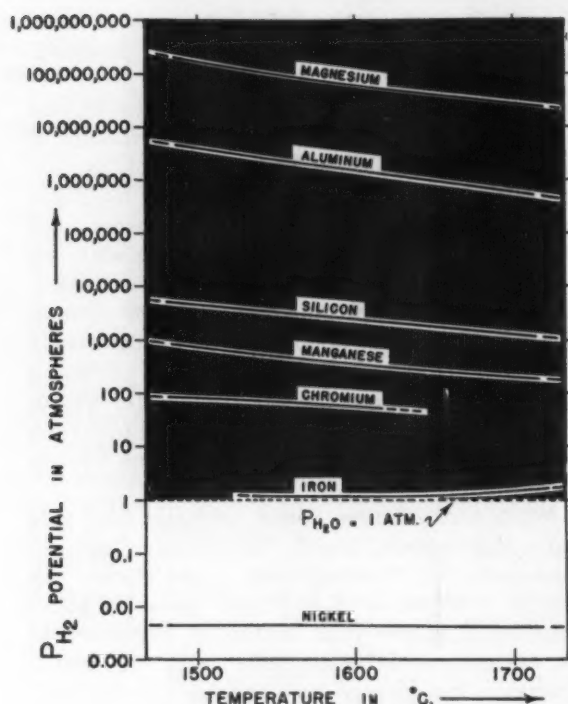


FIG. 5—Hydrogen potentials for a number of individual metals oxidized by steam at one atmosphere pressure. The curve for each metal is an underboundary calculated for metal saturated with its oxide.

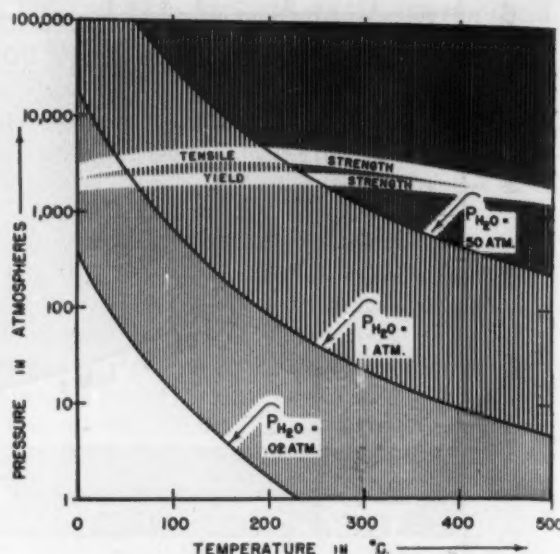


FIG. 6—Hydrogen potentials for steam contacting pure iron in the temperature range of stress-relieving and tempering operations. The highest steam pressure refers to steam boiler operations, and the lowest to hydrogen absorption from ordinary rusting reactions.

thermodynamic proportions in turn are sufficient to cause the gassiness.

Although these calculations of hydrogen potential have been based upon equilibrium measurements, an essentially kinetic condition is being considered. The equilibrium values therefore only define the direction that the reaction will take, and the limits to which it can go. All practical observations concern stops made along the road.

When iron or steel is first placed in the heat treating furnace there is a surface reaction between the metal and water vapor in the surrounding atmosphere. This reaction simultaneously produces a burst of nascent hydrogen, available for absorption, and a superficial film of oxide. The oxide then increasingly protects the metal from further reactions, proceeding toward complete prevention, pending upon many factors, but probably in every case markedly reducing the initial hydrogenizing condition.

In the case of the steam boiler, embrittlement only occurs when a certain concentration of caustic develops in crevices, such as those at riveted seams¹. It is very likely that a principal function of this caustic is to dissolve away the iron oxide which forms, thus exposing a continuously fresh surface of metal to the hydrogen-producing reaction.

To what extent the hydrogenizing may proceed is a matter for separate investigation in individual cases. That it advances far in short periods of time is proved by a series of experiments in which specimens were held in a dry atmosphere for 14 min at the hardening temperature, and were then exposed to steam for only 1

min before quenching. The result was a condition of embrittlement virtually indistinguishable from that for a 15-min treatment in steam.

High Potential From Rust

Over prolonged exposures, it is possible that hydrogen infusing during the early vigorous reaction importantly effuses when the injecting force subsides, due to a protective layer of scale.

In Fig. 6, some detailed calculations appear for lower temperature ranges applicable to tempering and stress relieving, and specifically pertaining to the phenomenon of boiler embrittlement. This graph picks up the curve from Fig. 4 and considers again only the case of iron saturated with oxygen. The values along the curves are therefore all minimum potentials, the higher ranges for commercial steels being indicated by the shaded area above each curve. Three curves are shown for three different pressures of water vapor. The central curve continues the plot from Fig. 4. The upper curve relates more directly to conditions of steam boiler operations; the lower curve is presented because of its relationship to ordinary conditions of humidity and its possible effect upon iron and steel.

Common ranges for yield and tensile strengths are included in order to illustrate conditions in which the potential hydrogen pressure exceeds the strength of the steel. The fact that even ordinary rusting reactions from water vapor in the lower temperature range produce high hydrogen potentials can be particularly significant where steel is subsequently covered with a relatively weak coating, such as paint. This may account for a large measure of the difficulty experienced with painting rusty steel.

Atoms Collect in Voids

As for boiler embrittlement, the data make a particularly strong case for the hydrogen theory when one realizes that these are minimum pressures being considered, and only pressures of pure hydrogen. Boiler embrittlement in most cases is a manifestation of a later stage in which the pressure of occluded hydrogen is further aggravated by gaseous reaction products.

The phenomenon is believed to represent the continuing precipitation of hydrogen atoms from the metal lattice into minute crystallographic voids where it accumulates as molecular hydrogen. The voids are essentially those involved in precipitation-hardening processes of other alloys, the only difference being that the precipitate here is a gas.

The crystallographic planes seating the hydrogen occlusions are also those involved in deformation and fracture. Collection of the gas under sufficient pressure interrupts normal slip activities and creates a condition of embrittlement. This is the planar-pressure theory for hydrogen embrittlement of the elemental hydrogen type, and the concept provides a clear ex-

planation for the otherwise puzzling aging minimum.

Since the hydrogen first advances as atoms directly into the metal lattice, the aging minimum represents that period of time following cessation of infusion in which the hydrogen atoms continue to diffuse through atomic interstices toward the precipitation sites. This continuing internal diffusion and precipitation aggravates the compression of the occluded gas pockets to increase embrittlement. Simultaneously, the gas explodes its way from pocket to pocket in what may be termed an occlusion-diffusion process, ultimately blasting its way to the surface where it escapes. This stage constitutes recovery.

These researches have completed at least the preliminary stages of developing and exploring the theory of the hydrogen potential. They have demonstrated experimentally the surprising embrittling effect of water vapor contacting ferrous materials at elevated temperatures. The results forcibly suggest that heat treating processes in common use today throw an unfair burden upon those properties of steel which sustain plastic deformation and are necessary to cold formability. Many ferrous materials, particularly the hardenable steels, probably actually allow an importantly wider range of workability than currently presumed because of unsuspected interference from hydrogen absorbed during heat treating operations.

Consequently, wherever operations concern a steel whose greater cold workability would be desirable, the defection resulting from hydrogenizing by steam should be carefully evaluated.

The Office of Naval Research sponsored the investigation on gas-metal phenomena from which the present material has been taken. The assistance of F. K. Landgraf, R. L. Phebus, and C. O. Worden in conducting the experimentation is acknowledged by the author; also the assistance of M. E. Haslem and M. M. Eckstein.

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CONTINUOUS CASTING

Featured at Electric Furnace Meeting

Sessions on practically all facets of electric furnace steelmaking were held but the continuous casting meeting stole the show. A wide disagreement in basic techniques of continuous casting of steel was aired.

OVER 600 attended the 8th Annual Electric Furnace Steel conference, held in Pittsburgh, Dec. 7, 8 and 9. The meeting, sponsored by the Iron & Steel Div., AIME, featured a continuous casting session which practically stole the show. Other technical sessions were held on raw materials, furnace maintenance, oxidation and melting practices, and special deoxidizers.

E. C. Smith, chief metallurgist, Republic Steel Corp., was chairman of the continuous casting session. Mr. Smith encouraged discussion and started off by declaring it was a wide open session and "anybody could ask anything with no holds barred." No holds were barred. From the time Isaac Harter, Jr., started until Mr. Rossi finished, nobody left the room. Mr. Smith very wisely cut the meeting off at the end of 2 hr and 20 min of the best technical session the AIME has thrown for a long time.

ISAAC HARTER, JR. watching a heat being teemed into the continuous casting mold at the Beaver Falls plant. The furnace at the left pours into the pouring ladle which is equipped with inverted weirs to trap any slag that may come through the furnace tap hole.



Mr. Harter, engineer in charge of continuous casting, Babcock & Wilcox Tube Co., Beaver Falls, Pa., compared present steel production with the new method. The advantages of direct casting into the 9 x 4 1/4 in. oval at Beaver Falls were precisely enumerated. Solidification patterns of round and square sections were pictorially presented and discussed. Harter maintained that the oval section is better from a quality standpoint. It offers more cooling surface and does not produce planes of structural weakness through pronounced columnar solidification patterns as do round, rectangular or square sections. Surfaces of the cast ovals are good. About 600 tons of bars have been produced so far by the joint B&W, Republic Steel project at Beaver Falls.

So far, sections of 25 to 45 sq in. have been cast and B&W is now building a mold of 100 sq in. to supply a continuous strip mill with 26-in. wide continuous cast slabs. Harter declared that 25 to 30 pct of the steel industry's total output could be converted to the new process by 1952 provided the scrap for electric furnace steel-making practice were available. He pointed out that continuous casting appeals first to nonintegrated steel producers and will not immediately affect the integrated companies except on specialty products like stainless.

Six Basic Features

The six important and basic features of continuous casting were covered in the talk. Mold design and casting shapes were both given minute attention. Melting practice and refractories, item No. 3, was only touched on. No. 4, control of the process with the help of X-ray and television, received mention. Product quality and production layouts, items 5 and 6, were well covered in both the schematic illustrations and the 16 mm movie of the process which was shown at the meeting. Many minor details crept into



T. J. McLOUGHLIN, chairman of the Eighth Annual Electric Furnace conference, addressing the group at the dinner meeting held Thursday, Dec. 7th. Mr. McLoughlin is assistant to the vice-president in charge of operations, Carnegie-Illinois Steel Corp. Others on the speakers' platform, left to right are: H. K. Work, director of research, NYU; Gilbert Soler, vice-president of manufacturing operations, Atlas Steels, Ltd. and C. F. Hood, president, Carnegie-Illinois Steel Corp.

the discussion in which T. W. Ratcliff and G. G. Zipf of B&W answered questions.

Major differences of opinion cropped up when Irving Rossi, eminent expert on continuous casting gave his unscheduled but highly interesting comments.

The movie, the picture talk and the discussion of Harter's paper brought out some new facts not yet published (See "Continuous Casting of Semifinished Steel," THE IRON AGE, Aug. 19, 1948, p. 72, for a technical description of the process).

Present casting speeds at B&W run from 4 ft per min to 6 ft per min. Most of the tonnages so far have been 0.10 to 0.20 carbon, 0.30 to 0.60 manganese killed steels with a few minor exceptions. B&W has cast 18-8 stainless, 0.70 carbon steel and 52100. Steel tonnage facilities for continuous casting can be built for about 30 pct of the present cost by conventional methods on a ton to ton comparison of finished steel products, Mr. Harter said.

Rossi Dissents

At the end of the discussion on Harter's paper, Rossi spoke off the cuff and quickly reviewed continuous casting in the nonferrous industry.

The Scovill Brass installation (See THE IRON AGE, Dec. 22, 1949, p. 59) was brought up and other nonferrous plus ferrous experiments and plants were intermittently covered by Rossi.

Mr. Rossi declared that the problems in casting steel were no different than those of the nonferrous products as far as his practice is concerned. Rossi employs a copper mold instead of brass and uses water to fill the shrinkage area between the inside of the mold and the skin of the partially solidified casting. He claimed that the cooling rates are so fast in this method of continuous casting that it makes no difference as to the chemistry being cast and there is no size limitation as to shape. Thermal conductivity of the metal being cast, Rossi told the group, is not a restricting factor. The only real restricting factor in continuous casting is the limit to which metal can be supplied to the mold. It is Mr. Rossi's opinion that the elaborate mechanisms thought necessary to control continuous casting of satisfactory shapes are not at all necessary. He told the group that, in his opinion, there was too much time and effort and worry spent on these factors and that essentially the continuous casting of any metal is a relatively simple affair.

Copper v. Brass Molds

He drew on his wide experience both in foreign and domestic continuous casting installations to minimize the alleged differences between continuous casting practice of ferrous and nonferrous metals. He recited from memory heat extraction rates of copper v. brass molds and casting speeds in sections as big as 10 x 48 in. in aluminum and 3 x 15 in. slabs of steel. Differences in latent heat of fusion between the metals were summarily dismissed and for those who may want to consider such factors at their leisure, the table is offered. These data have been translated from the Greek, via the German.

In presenting this coverage for the record, comments from some of those who officially took part plus opinions of other continuous casting experts in the audience who this editor found talking to themselves and others at great length after the meeting, are not included.

THERMAL PROPERTIES OF METALS

Material	Thermal Cond. Btu/ft-hr-°F	Heat Conductivity ft ² /hr	Density lb/ft ³	Specific Heat Btu/lb-°F	Melting Point, °F	Heat of Fusion		Heat Content Molten	
						Btu/lb	Btu/in. ³	Btu/lb	Btu/in. ³
Steel 70°F.....	29.5	0.52	487.5	0.12	2660	117	31.6	894	182
Steel 2182°F.....	19.45	0.26	472	0.16	2660	117	31.6	894	182
Copper.....	201.5	3.74	558	0.10	1978	90	29.0	317	101
Aluminum.....	111	2.93	168.5	0.23	1202	185	18.1	473	45.7
Brass.....	60.3	1.23	534.0	0.09	1652	79.5	24.1	288	87.7

Note: All values to approx. 2nd decimal place

From Stahl und Eisen vol. 69, Nov. 10, 1949



THE FINAL FORMING operation takes place in the "O"-ing press, where two dies shape the U-shaped plate into the actual pipe form.

PLANs have been announced for the construction of approximately 16,000 miles of gas lines in the near future. Of this, about 50 pct will consist of trunk lines over 26 in. in diam for the transportation of gas under high pressure. The steel tonnage involved and the consequent cost of large diameter gas lines requires that every pound of steel in the line be fully utilized. Lining up and welding cost must be kept to a minimum.

Electrically welded line pipe, as made by U. S. Steel Corp. in its twin mills¹ at McKeesport, Pa. (National Tube Co.) and Orange, Tex. (Consolidated Western Steel Corp.), is the result of extensive field and mill research. It introduces to the trade a product intended for gas transportation lines from 26 to 36 in. in diam. Seamless pipe is, at present, available in sizes up to and including 26 in. in diam. The two mills are capable of turning out 200,000 tons of pipe, or 1200 miles of 30-in. diam pipe a year.

Entering the National Tube Co. mill at McKeesport, Pa., at point A, Fig. 1, are freight cars loaded with steel plate from the Homestead Plant

¹ See "First Pipe Leaves New Twin Mills", *The Iron Age*, April 13, 1950, p. 102.

Mass Production

By D. A. EVANS
Supervising Engineer
Products Engineering Dept.
National Tube Co.
Pittsburgh



of Carnegie-Illinois Steel Corp. This plate is of the required dimensions and steel grade to manufacture electric weld pipe of the diameter, thickness and length specified in the customers' orders. An electro-magnetic crane lifts the plates from the cars and places them in a stock or storage area. As many as 10 or 12 plates may be so deposited and then processed, one at a time, through the mill.

The plate is conveyed to the first shearing machine, where the front end is cut square with the length so that the finished pipe ends will be at right angles with the longitudinal pipe axis. A close-up of shearing practice appears in Fig. 2. The squareness of the sides with the plate surface has great influence on the fabricating process and the quality of the finished product. Each of the plates, when formed by the O-ing press, follow one another through the welding machine to be longitudinally welded by one continuous weld. If they do not suitably butt a continuous weld will be more difficult to obtain, and production will be affected.

The second shearing machine performs the same operation on the other end of the plate. Edge guides on the conveyer tables, before and after the squaring shears, keep the plate in direct

OF 2½ MILES OF PIPE DAILY

Industry and the consumer are using natural gas on an ever-increasing scale, requiring the mass production of pipe for overland lines. One of the high-speed, assembly-line pipe mills can form, weld and cold-expand 100,000 lbs of 26 to 36-in. diam pipe a year.

line. The plate is now transferred along the route indicated in Fig. 1, to the plate planing machine.

The plate planing machine is one of the most important mechanisms in the production line. It is here that the longitudinal edges of the plates are simultaneously planed parallel to one another and square with the ends. The overall width of the plate is also accurately controlled. All these factors influence the facility of welding as well as the pipe diameter.

In the pipe expanding operation, the control of the amount of expansion of the pipe, and its resultant effect on wall thickness and physical strength, is governed by the outside diameter of the pipe as received from the mill and the inside diameter of the dies of the expanding machine. Accurate pipe diameter, as set in the planing operation, is therefore a critical operation.

Planing Squares Ends, Sets Diameter

The two long triangular shaped clamping bars at the plane are raised and lowered by two hydraulically operated cylinders. They serve the purpose of holding the plate in position on the bed of the machine while the plate edges are planed. One planer with its clamping bar is adjustable in a sidewise direction to accommodate the many different widths of plate required in the manufacture of electrically welded pipe.

Plate edges are planed by a series of ten facing tools. Each set is mounted on two carriages powered through triple threaded screws and traveling the length of the plate, performing the planing operation as they go. The operation is progressive, that is, each single point tool, Fig. 3, takes its share of the cut, thus reducing the load

and wear on each tool. Each of the ten high-speed steel tools takes a 1/32-in. cut, so that a total of 5/8 in. of metal is removed from each side of all plates.

Each planer has a cutting speed of 60 fpm with an idle return speed of approximately 100 fpm. The operator, riding on the tool bearing carriage, is able to control the movement of all of the planer machine parts from the control panel. The planer will handle 40 ft long plates, up to ½ in. thick and 120 in. wide.

The plate is now ready to be edge formed. This is the first of three forming operations. Edge forming is accomplished by passing the plate through a series of rolls. The operation consists of forming both longitudinal edges of the plate into the shape of a wide trough.

The edge forming machine contains three sets of rolls. The first rolls grip and draw the plate into the second pair where the edging operation is begun. The third pair complete the operation.

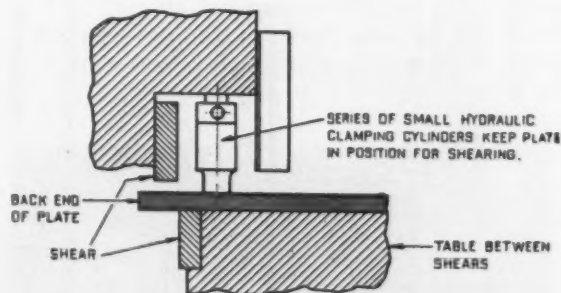


FIG. 2—Illustrating the shearing practice followed in squaring up the sides of plates with their surfaces.

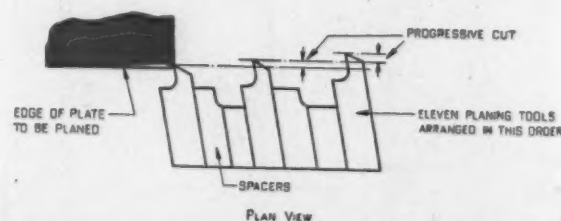


FIG. 3—This is the arrangement of ten facing tools used to plane longitudinal edges of plates. The operation is progressive, with each cutting edge taking a cut of 1/32 in.

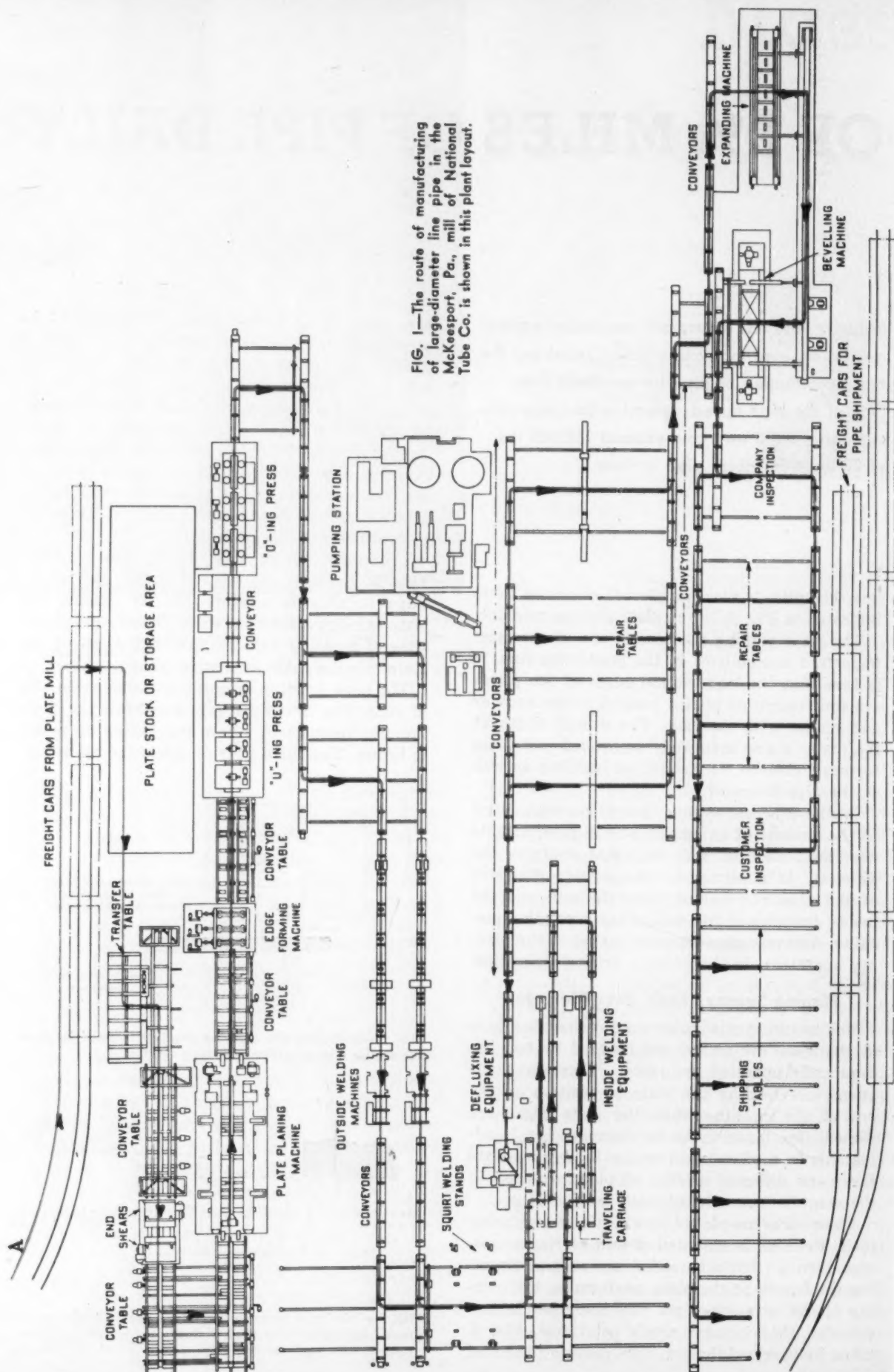


FIG. 1—The route of manufacturing of large-diameter line pipe in the McKeesport, Pa., mill of National Tube Co. is shown in this plant layout.

The rolls can be adjusted for various thicknesses and widths of plates. Edging of the plate to approximately the radius of the top die permits forming of the plate with minimum die wear. It also produces greater uniformity in the diameter of the finished product than would plate that was not edged.

The edged plate is now carried over a series of rolls to face the U-ing press. A ram, mounted between the rolls, contains a series of dogs which depress as the front edge of the plate passes over, then rise again as the end of the plate passes over each one. The last dog to rise is used to push the plate into position in the U-ing press. This arrangement has about a four-foot stroke.

A large U-shaped die, Fig. 4, able to accommodate the longest lengths of pipe fabricated, now moves downward on the edged plate under hydraulic pressure. Rocker type dies meanwhile automatically conform themselves to the operation, overbending the plate to allow for spring-back, thus aiding in forming the plate to the U shape.

Hydraulic pressure is maintained on the die until the plate metal has had full opportunity to go through the process of plastic deformation. This is apparent to the press operator when the hydraulic gage pressure drops a prescribed amount.

Four-unit Press "U"-shapes Plates

The press consists of four units mounted as a single unit, each having a capacity of 500 tons at 2500 psi hydraulic pressure, total capacity being 2000 tons. All movements of the press are automatically controlled. Pump motors and up and down stroke of the dies are push-button controlled. The press can also be controlled to give the pressure required for forming varying plate, which range in thickness from $\frac{1}{4}$ to $\frac{1}{2}$ in. and are often of different steel grades, having yield strengths of 42,000 to 52,000 psi.

At the O-ing press, p. 68, the plate is rounded to final form. When the plate leaves the U-ing press it travels over a series of rollers to the O-ing press. Rollers mounted on vertical spindles projecting from the conveyer table prevent the U-shaped plate from falling and keep it in correct alignment as it enters the O-ing press.

The U-formed plate enters the press with the two semi-circular dies set apart. The U-shaped plate fits into the bottom die segments and the top die halves, under hydraulic pressure, are forced down on it. The enormous pressure applied cold forms the plate until the two die halves meet and the plate is of circular shape.

The next oncoming U-formed plate forces the previously formed circular section out of the press and onto the run-out table. There it is rolled over a conveyer system to the storage area, where the heat number is applied.

It is extremely important that the formed ends be properly aligned for welding. For this purpose, two steel archways supporting a longitudinal

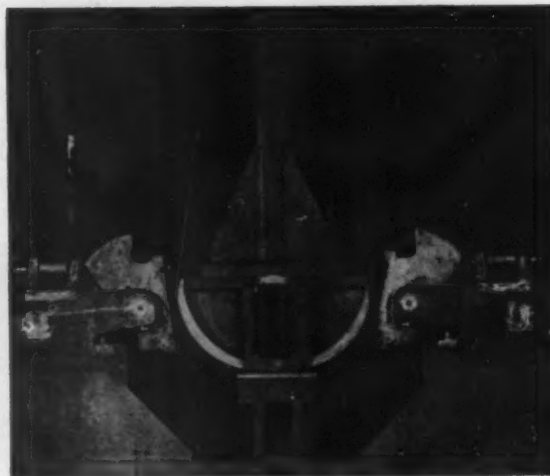


FIG. 4—The edge-formed plate is next shaped into a "U" by a rounded ram and rocker dies.

guide are located over the conveyer, the guide enters and continues along the space in the formed pipe, guiding it into the welder.

Welding is done by the electric submerged arc process. The O-formed plates are fed continuously into longitudinal seam welders, Fig. 5. Abutting edges are properly aligned, firmly pressed together, and fed at a controlled speed under welding electrodes. The weld is made by using two electrodes in close proximity to one another at a speed of approximately 60 inches to 85 inches per minute, depending on the plate thickness and its characteristics. The welding is done against a water cooled copper back-up shoe, which is supported tightly against the seam on the inside of the pipe.

The electrode is not in actual contact with the plate. The current is carried across a gap through a granular material or flux, laid down along the seam just ahead of the electrode and in



FIG. 5—The formed pipe is aligned, its abutting edges pressed together and then joined in this submerged arc seam welder.

which the end of the electrode is submerged. The entire welding action in this process takes place beneath the flux without visible evidence, such as sparks, flash or spatter. With the use of proper flux and rod, the process deposits weld metal which has a chemical composition very similar to that of the plate material. On the exit side of the welding machine, the fused flux on the seam of the pipe is broken off mechanically and vacuumed away from the work.

The outside welding is done to within about 3 in. of each end of each pipe length. This is because two welding rods are used in the process, and satisfactory grounding of welding current cannot be obtained as well at the pipe ends as along the pipe length.

The pipe, upon leaving the outside welding machine, travels over conveyers to the adjoining squirt welding stands.

The pipe is rotated manually on rollers, and the squirt welder now brings the weld to the vertical position and attaches a small plate approximately 3 in. square to the pipe at the point of the uncompleted weld. This plate serves a dual purpose. It permits completion of the weld to the end of the pipe, and also permits the inside welding machine to completely weld the inside length. This arrangement is sketched in Fig. 6. The plate is removed after all welding is completed.

The pipe, which now has been welded externally, is next conveyed to a motor driven carriage, which serves the inside welder. After proper positioning of the seam, which is now located on the bottom, and attaching the ground connection, the pipe on the carriage is propelled forward over a long cantilever boom, which exceeds the length of the pipe. The welding head is attached to the unsupported end of the boom, which is the entry side of the pipe. The same type of welding is employed as is used in welding the outside seam, except that no back-up shoe is used.

After the welding operation is completed, the carriage is retracted at high speed and the pipe removed to a unit which removes the spent flux. This is accomplished by running the pipe over a series of rollers and at the same time allowing the entry of a cantilevered tube with a vacuum attachment. This is slowly withdrawn and the vacuum pump goes to work sucking out all de-

posit left during the welding operation.

It is the practice to remove, by chipping and grinding, the surplus bead on the interior ends of the pipe for a distance of about 4 in., to facilitate alignment in the field.

Inside and outside welds of each length of pipe are carefully inspected for breaks, pin holes, or metallic slivers. The welding crew corrects such defects when found. The inside of the pipe is examined by an inspector who traverses the entire length on a specially constructed buggy, shown at the left.

The fabricated pipe is given its finished diameter, wall thickness and physical properties in the cold expanding operation. These are obtained by hydraulic expansion of the pipe against semi-circular die heads.

The jacket consists of a series of dies, semi-circular in shape. All are hinged and can be opened to receive the pipe from the conveyer system. There are eight such die sections and each is individually operated.

The movement of all mechanisms in the expanding machine are controlled from one panel, and the operator begins the sequence by closing all dies on one side of the positioned pipe. A cross-sectional drawing of the pipe clamped in position is shown in Fig. 7.

The ram, under hydraulic pressure, is now advanced into one end of the pipe. The far end is thus forced against the fill head, through which water to perform the expanding operation will enter the pipe. All dies on the exposed side of the pipe are closed. The clamping bar, under hydraulic pressure, is forced against the dies, keeping them in this position during the expanding operation.

The water is pumped through the fill head until the predetermined hydrostatic pressure is obtained. This, of course, depends on the size, thickness and grade of steel being fabricated.

A dial-type indicator gage on the control panel enables the operator to observe the rise in pressure, fluctuation of the needle through expansion range of the pipe, and the point at which stabilization of pressure takes place with completion of expansion.

The operator now lowers all dies along one side of the pipe exposing the longitudinal electric weld. The pressure is dropped and reestablished



AN INSPECTOR traverses the entire length of each pipe on a special buggy, carefully examining the entire length of the interior weld.

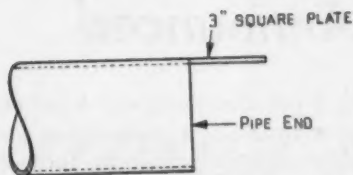
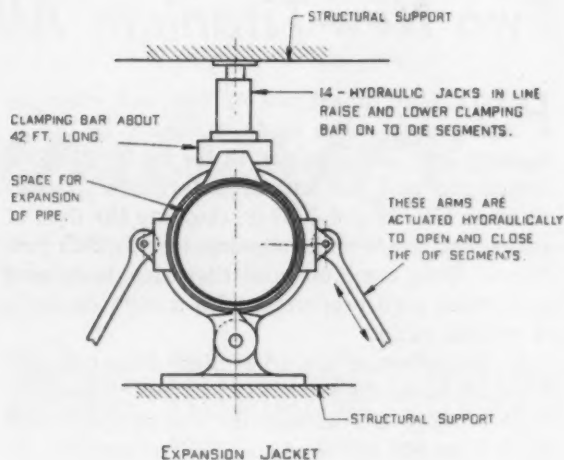


FIG. 6—Above, before completing the welding of the exterior and interior end of the pipe seam, a small plate approx 3 in. square is attached. This practice is followed because two welding electrodes are used in welding the seam, making it difficult to obtain satisfactory grounding of welding current at the pipe ends.

FIG. 7—At right, cross-sectional view showing welded line pipe clamped in hydraulic expansion jacket used to impart finished diameter, wall thickness and improved physical properties.



at the specified test, which is held for about 10 sec. While under this test, two air-actuated hammers strike the pipe in rapid succession. An impact stress is created which is conveyed in wave fashion throughout the length of pipe. This results in a temporary increase in stress throughout the weld and a consequent check on the weld structure. The exposed weld is now checked for sweats or leaks. This being done, the remaining dies are lowered, the pipe ejected and sent on its

way to one of the beveling and facing machines.

Correct alignment for field welding can be obtained only if each length of pipe is squarely faced and beveled at right angles with the longitudinal axis at the mill. Each of the beveling and facing machines is equipped with expanding arbors that are inserted into the pipe ends. These hold the pipe in line while the beveling head, with three facing tools attached, rotates and performs the facing and beveling operation.

INERT-ARC PROCESS WELDS ALUMINUM WITH NO FLUX

NO flux or special cleaning was required when fabricating aluminum salt bins at the Day Co., Minneapolis. Use of General Electric inert-arc welding eliminated the expensive flux removal problem and nullified corrosive action due to entrapped flux.

The Day salt bins have an overall height of 10 ft. 3 in., with diameters ranging from 6 to 8 ft. They are fabricated from 61S-T6 aluminum of various gages through $\frac{1}{4}$ in. No preheat or special cleaning was used, and because of the bulkiness of the bins, many welds are made in the vertical-up and vertical-down positions.



Two New Titanium Alloys Announced

PILOT plant quantities of two new titanium alloys have been made available by P. R. Mallory, Inc., Indianapolis, in the form of ingots, forged rod and bar and drop forgings. Designated as L-2748 and L-2749, they are the first of a series of alloys under development by this producer. Both combine good corrosion resistance and useful high properties with a high strength to weight ratio.

A comparison of the properties of the two new titanium alloys shows that the strength to weight ratio of alloy L-2748 exceeds that of SAE 1010 steel, Type 303 stainless and 24ST aluminum. In

L-2748, 5 pct aluminum and 5 pct chromium are alloyed with the new engineering metal.

Like other titanium alloys, these two new materials machine similarly to stainless steels such as 18-8, and can be lathe turned, drilled and tapped. Carbide tools are recommended. Small round stock (up to 1 in. in diam) is best cut by a "soft" cutoff wheel at 1800 to 3600 rpm with a water-and-soluble-oil coolant. Larger cross sections require the flame-powder method of cutting. To grind titanium, a wheel which breaks down rather rapidly is advised. The table shows comparative properties of the two alloys.

COMPARISON WITH OTHER STRUCTURAL ALLOYS
(Forgings)

PROPERTY	Mallory Titanium Alloy L-2749 (Tentative)	Mallory Titanium Alloy L-2748 (Tentative)	Steel Cold Rolled SAE 1010	Steel Stainless Type 303	Aluminum 24ST Alloy
Ultimate Tensile Strength (psi)	90,000	165,000	55,000	90,000	70,000
Yield Strength (0.2% Offset), (psi)	75,000	153,000	25,000	35,000	41,000
Elastic Modulus ($\times 10^6$), (psi)	16.3	19.0	30.0	29.0	10.0
Elongation (% in 2 inches)	18	10	20	50	15
Endurance Limit—Fatigue (psi)	63,000	95,000	.....	.....	18,000
Coefficient (Deg. C.) of Linear Thermal Expansion	10.4×10^{-6}	9.0×10^{-6}	13.5×10^{-6}	18.0×10^{-6}	23.2×10^{-6}
Density—Lbs./Cu. Inch	0.16	0.16	0.28	0.29	0.10
Ultimate Strength/Density	562,000	1,030,000	196,000	310,000	700,000
Elastic Modulus/Density	102×10^6	112×10^6	107×10^6	100×10^6	100×10^6
Electrical Resistivity Microhm—CM.	60	140	10	73	6
Hardness Rockwell "A"	62	71	44	50	45

Stainless Resistor Gives High Starting Torque

FOR their new earthmover, R. G. Le Tourneau, Inc., has developed a new method of transmitting power to wheels, steering mechanisms and winch. A diesel engine turns a D.C. generator which distributes current to drive motors on each of the vehicle's four wheels. A similarly driven A.C. generator provides current for three induction motors which operate the steering system and the winch. This diesel-electric system overcomes some of the shortcomings of mechanical, hydraulic and pneumatic power transmission and control arrangements. It is more efficient, lighter in weight, has fewer moving parts and the only required connecting elements are flexible wires.

The A.C. induction motors powering the winch and steering mechanism are uniquely designed, having high, built-in rotor resistance that assures a high starting torque. By using a stainless steel

resistance bell, the same effect is obtained as when a starting resistor is inserted in a wound rotor.

In the Le Tourneau induction motor, the rotor's heavy copper bars extend through the rotor's laminations, flare upward and outward, and are welded to the stainless bell. The opposite ends of these bars are welded to a low resistance iron ring. Thus, the unusually high temperature coefficient of stainless steel gives the combination a variable resistance.

As the speed of the rotor increases, the finned design of the resistor bell sets up a fanning action which cools it. This decreases rotor resistance and increases motor efficiency and speed. Only 11 in. in diam, the new A.C. motor will pull 120 ft-lb stalled and 80 ft-lb at 2700 rpm. From a standstill, it attains its running speed of 3600 rpm in 1/6 sec and reverse in 1/4 sec.

news of industry

Industry Confronted by Price Rollback Orders

But also gets set of standards under which prices may go above Dec. 1 levels . . . ESA tells producers of basic raw materials to expect cuts on raised prices—By Gene Hardy.

Washington—Industry this week was confronted with a demand for a price rollback to Dec. 1 levels, but also had before it a set of "voluntary" standards under which prices can be raised.

Producers of basic raw materials were also told by the Economic Stabilization Agency to expect reductions in prices that were increased between June 24, 1950, and Dec. 1, 1950, in accordance with the "voluntary" standards, where such action is necessary to assure the maintenance of Dec. 1 price levels at later stages of manufacture.

Basic Metals, Scrap

It is understood that this portion of the ESA statement of policy was pointed at a wide variety of materials, including basic metals and scrap. Any specific products, such as that covering passenger automobiles, remove the product in question from the "voluntary" order. Some of these orders, particularly on scrap, are scheduled for issuance early next month.

At press time, a "voluntary" policy covering wages and salaries was also in preparation.

Terms of Price Rises

The pricing standards under which increases above Dec. 1 levels will be recognized are as follows:

(1.) Prices may not be increased by any manufacturer or industrial

producer whose net dollar profits before taxes are equal to or in excess of its average net dollar profits before taxes in the period 1946-49, except as provided in the following standard.

(2.) As to an individual material or service sold by a company whose net overall profits are running above the general earning standard as set out above, the price of such particular product or service may not be increased if it is being sold at a profit. In case of a particular material or service which is not profitable, the price may be increased but in no case by more than (a) the amount necessary to make it profitable or (b) the amount of the increase since June 24, 1950, in the cost of direct wages and materials going into this product, whichever is lower.

(3.) As applied to the distribution trade (wholesale and retail) gross margins may not be increased above the June 1950 level if net dollar profits before taxes of the distributor are equal to or in excess of average net dollar profits before taxes of the distributor in the period 1946-49.

(4.) Distributors may not increase their prices on the basis of increases in replacement costs or market costs. Margins may be added only to inventory cost actually paid.

If these standards are disregarded, ESA warns that manda-

Turn Page

Asks Price Hike Notice

Washington — The Economic Stabilization Agency has asked 250 major business firms to advise the agency at least 7 days before making any price increases on products whose annual volume exceeds \$500,000.

Excluded were firms which will soon be the subject of special price orders, including steel and other major metals.

Reliance Plans New Euclid Plant

Cleveland—Plans for expansion of manufacturing facilities have been announced by J. W. Corey, president of Reliance Electric & Engineering Co. A 60 acre tract has been purchased in Euclid. Construction of a one story building, at a cost of \$1½ million, will provide 130,000 sq ft of plant space. The building will follow the basic plan of the plant built at Ashtabula 4 years ago.

Directs Canadian Steel Controls

Ottawa—Steel control goes into effect in Canada Jan. 1, 1951. Kenneth Harris, Toronto economist, was named director of the steel division, and will take charge of steel controls.

A business consultant, Mr. Harris was associated with Harvard Business School as assistant dean before and after World War II. During the war he served with the Prices and Trade Board and later became director of research for the Munitions Department.

INDUSTRIAL SHORTS

WESTERN MARKET — Wintroath Pumps, Inc., Alhambra, Calif., has been acquired by the **WORTHINGTON PUMP & MACHINERY CORP.**, Harrison, N. J. The Wintroath company will operate as a wholly owned subsidiary of Worthington and will continue under the present management.

RELEASES FILM—A motion picture entitled "The Shortest Way" has been released by the **DOEHLER - JARVIS CORP.**, New York. The company states that the film describing the manufacturing processes in die-casting coincides with the beginning of the national emergency.

MORE SPACE—Approximately 85,000 sq ft of additional floor space in Germantown, Pa., has been acquired by **LEEDS & NORTHRUP CO.**, manufacturers of electrical measuring instruments, automatic controls and heat-treating furnaces.

MERGER — The Pittsburgh Limestone Corp. has merged with the Michigan Limestone & Chemical Co., two U. S. Steel Corp. subsidiaries. They will be known as the **MICHIGAN LIMESTONE & CHEMICAL CO.** with executive offices in Detroit. Irvin L. Clymer, head of both present subsidiaries, will become president of the merged company.

GROUP OFFICERS—Robert H. Daisley, vice-president of Eaton Mfg. Co., Cleveland, is the new president of the **AUTOMOTIVE & AVIATION PARTS MANUFACTURERS ASSN.** Other officers are: W. G. Hancock, vice-president; and James L. Myers, secretary-treasurer.

NAMES DIRECTOR — Louis Polk, president of the Sheffield Corp., Dayton, was elected a vice-president in charge of all technical divisions and committees and also a member of the National Council and a director of the **AMERICAN ORDINANCE ASSN.**

BUYS GOVERNORS — The Pickering Governor Co. has been purchased from the Hartford Empire Co., Hartford, by the **CHAMPLAIN CO., INC.**, Bloomfield, N. J. All operations of Pickering Governor have been moved to the Champlain plant in Bloomfield.

EXPANDING—The Thomas M. Royal plant in Philadelphia has been purchased by the Brown Instruments Div. of **MINNEAPOLIS-HONEYWELL REGULATOR CO.** The company has also acquired about 60,000 sq ft of undeveloped property in addition and adjacent to its new site.

AIME LEADERS—Willis McGerald Peirce, assistant to the general manager of the technical department of the New Jersey Zinc Co., Palmerton, Pa., has been elected president of the **AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS.** Joseph L. Gillson and Michael L. Haider were named vice-presidents and directors of the institute for 3 years.

WEST COAST SALES — A plant in South San Francisco has been purchased by **SUN TUBE CORP.**, Hillside, N. J. The King and Anderson sales agency with offices in San Francisco, Los Angeles, Portland and Seattle, will represent Sun Tube on the West Coast.

MOTOR DEALER — Allis-Chalmers Mfg. Co., Milwaukee, has named the **VOLLAND ELECTRIC EQUIPMENT CO., INC.**, Buffalo, a dealer for their motors, controls and transformers in Erie and Niagara counties in New York State.

HEADS CHAPTER — Sherrard G. Nott, Frank H. Nott, Inc., Richmond, has been elected to head the Seaboard Chapter of the **INSTITUTE OF SCRAP IRON & STEEL.** Irvin I. Lazinsky, Continental Iron & Metal Co., Baltimore, was named vice-president; and Julian C. Cohen, Julian C. Cohen & Co., Inc., Bladensburg, Md., secretary-treasurer.

tory action will follow "at the earliest feasible time." Such action will make use of a base period ending not later than Dec. 1, 1950, and no benefit will be derived from price increase after that date.

Manufacturers were also warned to maintain the same proportionate production of lower-priced items as in the pre-Korean period. In determining whether a price increase is permissible under the above standards, sellers must base their determination only upon actual experience. It is not permissible, says ESA, to raise any price on the basis of a forecast of conditions that may prevail at some later date or of costs which are estimated without experience.

Bureau of Labor Statistics Issues Escalator Clause Guide

Washington—A guide to negotiating cost-of-living wage clauses in labor pacts has been set forth in a recently-issued pamphlet of the Labor Dept's Bureau of Labor Statistics.

Included in the pamphlet are excerpts from the 1949 General Motors contract with the UAW which set the pattern for subsequent contracts within industry. The Bureau mentions that publication of the booklet does not constitute an endorsement of escalator clauses but acknowledges that the practice is widespread and merits treatment.

Free copies of Cost of Living Adjustment in Collective Bargaining are available from the Bureau of Labor Statistics, New York Regional Office, Suite 1000, 341 Ninth Ave., New York 1, N. Y.

Westinghouse Plans 3 Plants Under Electronic Tube Division

New York—Westinghouse Electric Corp. has formed an electronics tube division and has plans for three new plants to manufacture various types of tubes.

Formation of this new division is but one step in the company's plans to realign its facilities for maximum production of needed

military equipment, according to Gwilym A. Price, president. He said the new plants will undoubtedly produce electronic tubes needed for the defense effort.

The National Production Authority has established limits on DO orders for electronic tubes

which producers must accept. If the tube is produced by only one company the company must accept DO orders up to 50 pct of production. If more than one company makes the tube they must accept DO orders up to 25 pct of their output.

Thus far DO orders have not been placed very heavily and their impact has hardly been felt by some industries. Ultimate war effort is still in the future, but because of these metal shortages civilian production is dropping off faster than war production is picking up. The result is a stark gap in manufacturing which, it is feared, will cause skilled worker loss.

When these industries do get into war work they would be seriously hampered by such a loss of skilled men and the total production would not be able to hit the necessary peak as soon as would otherwise be possible.

NPA Nonferrous Cutbacks Slow Civilian Output

Producers caught in middle of transition to war output with their stocks down . . . Aluminum cutback will mean substitutes and retooling for automotive industry—By Bob Hatschek.

New York — Repercussions of the National Production Authority's cutback orders on the nonferrous metals are being felt far and wide throughout industry in the current changeover from peacetime to wartime economy. Despite the magnitude of proposed war production, civilian output is continuing on a somewhat curtailed scale and the reduced availability of these metals is putting the squeeze on some manufacturers.

Nickel for Cobalt

Aluminum, cut back 20 pct in January, 25 pct in February and 35 pct thereafter, is used extensively in the automotive industry for pistons. Replacement by cast iron, also in critically short supply, would cause several problems. Engines would have to be balanced all over again and design and tooling would have to be changed for more than just pistons.

The use of this metal, as well as copper and nickel, for decorative fixtures will have to be reduced drastically if not completely eliminated.

Widely used in the electronics industry for permanent magnets, cobalt permitted in civilian goods has been cut in half since the beginning of December. This shortage caused the cancellation of one conversion order for strip steel but when it was found to be too late to stop the order the user was just as happy—he had decided to substitute nickel for the cobalt normally used.

Last week tin was added to the list of nonferrous metals for which the NPA has issued conservation orders; for civilian products it was cut back to 80 pct of the base period as of Feb. 1 (see p. 81 for complete details). This will necessitate thinner plating in some instances, increasing lead proportions in tin-lead alloys such as solder and babbitt, the use of blackplate for some items, and the substitution of cardboard or fiber for tinplate in some containers.

In many instances there are sufficient supplies of steel and other materials for non-essential products but the squeeze is put on the producer by the lack of enough of the nonferrous metals which play only a small role quantitatively but are nevertheless essential to his product.

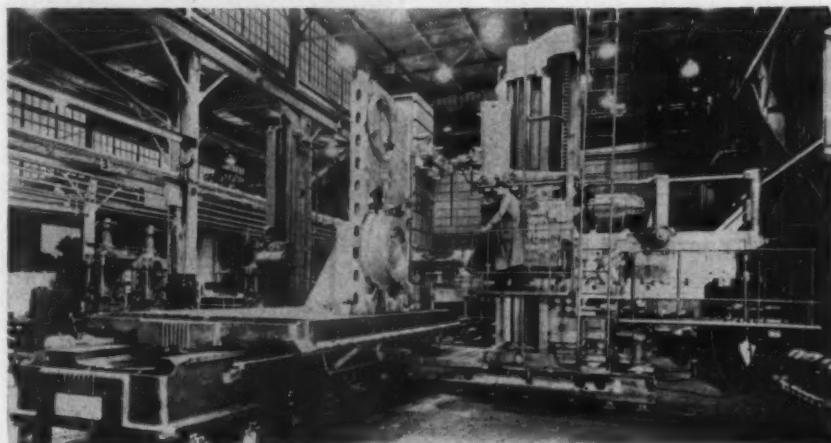
Washington Industry Confer To Cut Down Overall Copper Use

Washington — Less, not more, copper is in prospect for non-defense uses including the manufacture of automobiles and parts, hardware and plumbing supplies.

This was evident last week after a conference of government production officials and a dozen separate industry groups. Industry representatives were told that a new copper order is in process but the point was stressed that reduction in the overall use of copper is still the aim, rather than elimination of specific end items.

To this end, the government asked industry groups to make recommendations as to what items can be voluntarily eliminated.

BOUND FOR EUROPE: This large horizontal boring, drilling and milling machine will be installed in the Renault Motors Co. plant near Paris under provisions of the Marshall Plan. It was built by the Giddings and Lewis Machine Tool Co., Fond du Lac, Mich., and is equipped with General Electric electronic amplidyne feed drives and three dimension electronic tracer control system.



Prices Raised After Dec. 1 Cut by International Harvester

Chicago—International Harvester last week withdrew price increases put into effect after Dec. 1 on farm tractors, farm implements, power units, industrial wheel tractors, crawler tractors, motor trucks, service parts, attachments and twine.

The roll-back to Dec. 1 prices were effected in a desire to support anti-inflationary measures and cooperate with the Economic Stabilization Agency, said J. L. McCaffrey, president. However, it was pointed out that the action was taken without being sure if it was required under the ESA's announced price standards. Mr. McCaffrey stated that price increases made since Dec. 1 only partially covered rising wage and materials costs.

Supply Defense, Civilian Needs

Chicago—Despite government restrictions and consequent materials shortages, the wirebound shipping container industry will be able to supply both defense and civilian needs, agreed members of the Wirebound Box Manufacturers Assn. at a recent meeting here. Sales and production volume for the industry has set a record.

Jap Ship Carries Scrap Metal

Philadelphia—The first Japanese ship to use the Panama Canal since Pearl Harbor docked here last week with 6000 tons of scrap metal aboard. The 7167-ton freighter Pacific Maru, built last year at the Nagasaki Shipyard and Engine Works carried a cargo for Northern Metals Co.

Platinum Imports Double in '50

New York—Imports of platinum group metals for the first 9 months of 1950 totalled 300,000 oz, including 185,000 oz of platinum. This doubled the imports of these metals for the same period of 1949. Almost all of the platinum group metals (platinum, palladium, rhodium, ruthenium, iridium

and osmium) used in this country are imported.

The main use of the group is as catalytic agents in chemical processes but some is also used for certain electrical properties and some is used in plating to obtain specific surface features.

Freight Car Backlog Climbs To 126,870; Nov. Deliveries 5791

Washington—The tremendous surge in freight car orders was pointed up in a recent estimate by the American Railway Car Institute and the Assn. of American Railroads showing 126,870 freight cars on backorder during December compared with 14,146 on backorder in December 1949.

Deliveries of new domestic freight cars in November of this year totaled 5791. Of these, 3352 were built by carbuilders and 2439 by railroad shops.

Orders for new freight cars totaled 10,573 in November compared with 21,893 in October. Carbuilder companies will produce 9573 of these.

Three types account for the largest portion of cars on backorder: 49,407 plain box, 29,316 gondola, and 21,436 hopper.

Of undelivered cars on order, 91,512 will be produced by carbuilders and 35,358 by railroads.

DIVING BELL? The workman looks as if he is preparing for an underwater expedition. In reality he is in what is believed to be the largest double-ported control valves ever built. It was built by Kieley & Mueller, North Bergen, N. J. With 36-in. pipe connections the huge valve must open and close fully within one second.



U.S. Moves to Aid Canada With Freight Car and Warehouse Steel

Washington—A third supplement to order M-1, issued recently, provides for allocation of 8000 tons of steel products monthly during March, April, May, and June to enable Canada to complete its 11000 freight car program.

Product breakdown of the steel to be furnished each month by U. S. suppliers is: plates, 1600 tons; structurals, 3000 tons; and hot-rolled sheet and strip, 3400 tons.

Directives will be issued to steel producers to accept orders from Canadian car builders, the orders to be certified by the Canadian Dept. of Trade and Commerce and approved by the U. S. Defense Transport Administration. A lead time of 45 days is provided.

Simultaneously, an amendment to M-6 provides that U. S. producers shall allocate proportionate percentages of production to regular Canadian warehouse customers, based on the monthly averages for the first 9 months of 1950.

Extension of Canadian DO ratings for industrial or merchant trade steel product except to replace inventory stocks delivered under rated orders is not permitted.

Geneva Steel to Expand

An expansion program to increase Geneva Steel Co.'s ingot capacity by about 11½ pct has been approved by U. S. Steel Corp, according to Dr. Walther Mathesius, president of Geneva Steel. The program calls for increasing the present net capacity of 1,400,000 net tons by 160,000 tons.

Major additional facilities required are: one openhearth furnace with auxiliaries bringing the total to ten; two overhead traveling cranes; one two-hole soaking pit furnace, bringing the total to 16; building extensions and additional storage bins. The program will take about a year.

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NPA Cuts Civilian Tin Use To 80 Pct of Rate in First Half '50

Washington — Use of tin for civilian purposes during February and March 1951 is restricted to 80 pct of the rate of use during first half 1950 under an amended M-8 order issued this week by the National Production Authority.

In order to ease the impact, use during January is permitted at 100 pct of the first half rate. At the same time, inventories of both pig tin and alloys (1.5 pct or more tin), except ores and concentrates, were limited to 60 days or a working minimum, whichever is less.

An exception is made in the case of tinplate manufacturers who are permitted inventories of pig tin at the 120-day level. Tin for maintenance, repair and operating supplies is permitted at 100 pct of the first half base rate.

Scrap dealers may not add to inventories unless they have on hand at the time of taking a new delivery.

Strikes Idle 1500 Workers

Birmingham — Three strikes in metalworking plants in this area idled more than 1500 workers last week. Struck plants were: U. S. Cast Iron Pipe Co.'s Bessemer plant, Ingalls Iron Works, and its affiliate, the Birmingham Tank Co.

The USW ordered U. S. Cast Iron Pipe workers back to work, calling the strike over wages unauthorized, but work stoppage forced by the gas shortage made it impossible to determine whether or not workers would have heeded the USW's command.

Wins SKF Prize for Ingenuity

Philadelphia — Ingenuity of M. M. Tompkins, general manager of the Allied-Arkansas Bearing Co., Little Rock, in prolonging ball bearing life won him the first incentive award in a contest being held among its distributors by SKF Industries.

Tompkins was called in by an aluminum plant to investigate repeated failure of bearings in an alumina carrier. He found that

the fine metallic powder was entering the unshielded bearings through grease holes. Alumina collected around the fittings was pumped into shafts and bearings when grease was added.

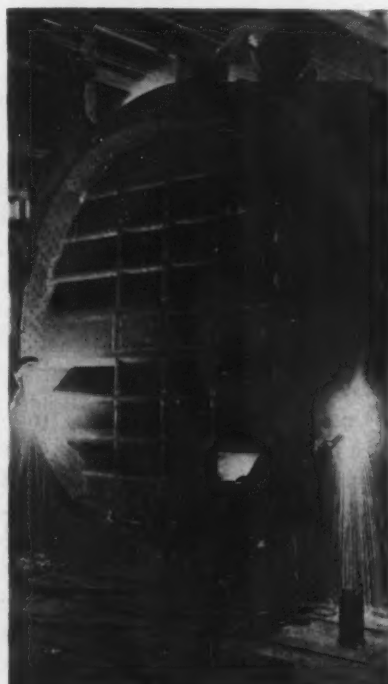
He suggested the use of bearings with double seals and the removal of the grease fittings. Holes left by fittings were plugged and grease was packed around the outside of the bearings to trap alumina.

Freezing Spell Shuts Down Plants Using Gas in Operations

Birmingham — With more below-freezing weather promised, all manufacturing plants here that used gas in their operations shut down last week as the temperature hovered around 16 deg.

The Alabama Gas Co. and Southern Natural Gas Co., suppliers of gas to some plants through its main line, said contracts with manufacturers provides shutting off gas in shortages — such as in cold weather.

WELDING PROJECT: About 8500 lb of welding rod was needed to fabricate this 65-ton steel "riser" for the Fort Peck Dam in Montana. Welders are shown at work in the South San Francisco, Calif., plant of Consolidated Western Steel Corp. Steel plates for the grid pattern are 4 1/4 and 3 in. thick—making the use of heavy welds imperative.



K-F May Produce War Planes In Giant Willow Run Auto Plant

Stratojet, flying boxcar, fighter being considered by Kaiser staff

Washington — Willow Run, the Ypsilanti, Mich., plant where Ford Motor Co. turned out B-24 Liberator bombers during World War II, may once again produce the planes of war.

John A. McCone, Air Force Undersecretary, has confirmed reports Henry J. Kaiser is investigating the possibility of building planes at the huge Willow Run plant.

Being considered are: The Boeing B-47 Stratojet, a 6-engine medium bomber with a rated speed of 600 mph; the Fairchild C-119 Packet, the 2-engined "Flying Boxcar" now in use in Korea; and a jet fighter not yet identified.

Defense Work a Condition

Kaiser-Frazer Corp. recently received a \$25 million dollar RFC loan. One of the conditions of the loan was that Kaiser would make "conscientious efforts" to get defense work.

Lt. Gen. K. B. Wolfe, Air Force deputy chief of staff for materiel, is reported to have requested Fairchild Engine and Airplane Corp. to supply Kaiser-Frazer with production information on the C-119.

Since World War II the Willow Run plant has been used by K-F for automobile production.

Malleable Castings on Upswing

Washington — Malleable iron castings shipments during October rose 8000 tons over the previous month to a total of 90,000 tons. Unfilled orders also increased 8000 tons from September to 160,000 tons in October, according to the Bureau of the Census.

Start Work on \$750,000 Plant

Brewton, Ala. — Construction has started here on a \$750,000 wirebound box factory to replace one destroyed by fire a few months ago. The plant is being built by the T. R. Miller Mill Co., Pittsburgh, Pa.



Reconditioning Drums Saves Steel

Newark, N. J.—“Save steel” is becoming a slogan of necessity in America. Acme Steel Drum Co., this city, is devoted to that task. It reconditions used steel drums for firms shipping liquids, paints, chemicals, etc.

The steel drums come into the plant, dilapidated and battered. They are run through a production line that produces finished drums in excellent shape at 330 to 360 per hour. A steam and caustic soda solution washes out the drums inside and out. After draining and drying, Leiman Vacuum Pump hoses suck out drops of solution still sticking to the bottom.

Drums are then straightened, sand blasted, fitted with new tops and gaskets, and painted on the outside. Some get new interior coats. Electric ovens and a conveyor system dry the paint.

Fabricators Feel Pressure To Follow Steel Wage Pattern

Pittsburgh—Fabricators under contract with the United Steelworkers of America, CIO, are under pressure to grant employees pay increases patterned after the basic steel settlement even though many contracts are not immediately reopenable.

As a result some 300 fabricators have already signed up, most of them in advance of contract expiration dates. The 16¢-an-hour basic steel pattern has been followed almost universally.

Cannot Ignore Pressure

It is expected that eventually most of the nation's 1600 fabricators will swing into line, although employers have a right to insist that existing contracts run their course, and the USW has pledged that these agreements will be lived up to.

However, it is difficult for the fabricators to ignore the pressure from employees who see fellow

workers in other plants getting increases, not to mention the danger of losing skilled workmen attracted by higher pay rates. With a huge defense program and increased draft quotas in the offing, the labor market is tight.

Lear Gets Air Force Contracts

Grand Rapids, Mich.—An additional \$8 million in Air Force contracts were awarded to Lear, Inc., of this city, recently. They are for Lear F-5 Automatic Pilots and Automatic Approach Couplers. With these contracts Lear has a total backlog over \$25,500,000.

Ford Plans Texas Parts Depot

Dearborn—Purchase of a nine-acre site in Dallas, Texas, for construction of a service parts depot has been announced by Ford Motor Co. A one-story building, 240 ft x 500 ft, will provide about 120,000 sq ft of floor space. The depot will service dealers in Texas, Louisiana and New Mexico.

Huge Expansion Outlined By Youngstown Sheet & Tube

Youngstown, O.—Youngstown Sheet & Tube Co.'s \$90 million expansion program at its Indiana Harbor works will increase ingot capacity by 925,000 tons per year. Pig iron capacity will be expanded by 500,000 tons, and coke capacity by 430,000 tons.

The program includes a 1400-ton per day 28-ft diam blast furnace, four new 250-ton open-hearth furnaces in addition to four furnaces now under construction, a 75-oven battery of coke ovens, an extension to the strip mill finishing department, a new slabbing mill, eight two-hole soaking pits, new slab heating furnaces at the hot strip mill, an 800-psi steam boiler.

Get Fast Tax Write Off

A 675-ft extension to the ore yard and dock, two new ore unloaders, one turbo-blower, additions to the water treating plant, a new high back pressure turbo generator, and a new water intake tunnel and pump house.

The National Security Resources Board has issued the company a certificate of necessity permitting amortization over five years of \$86,095,000 of the cost of the program for tax purposes.

The new openhearth will increase ingot capacity by 1,225,000 tons per year, but the new increase will be 925,000 tons since the company's bessemer steel plant will be discontinued upon completion of the first four openhearth.

When the program is completed the company's ingot capacity will be approximately 5,200,000 tons. New pig iron capacity will be 4,100,000 tons.

Titanium Plant Considered

New York—Several buildings have been leased by National Lead Co. and negotiations for power have been completed at Henderson, Nevada. The company is considering production of titanium at this site but final decisions have not yet been made.

Record Demand Outpaces Peak Zinc Delivery

Zinc Institute stresses that output can't be jacked up overnight . . . Long-range planning needed . . . Inadequate mine production is major drawback . . . Hope imports can go up.

New York — Demand outpaced the slab zinc supply in 1950 because of upsurging civilian and stockpile needs that resulted in record deliveries, exceeding those of World War II, said the American Zinc Institute in a pre-release of a chapter to appear in its Review of the Zinc Industry.

Output Tops 1949

The Institute pointed out that production cannot be increased overnight but that long-range planning and inducements to attract risk capital is needed to overcome the main hobble to expansion—shortage of concentrates and scrap to feed smelters and refineries.

U. S. Smelters and refineries in 1949 produced 870,000 tons of primary and secondary slab zinc and stocks steadily increased to over 94,000 tons at the end of December. In the boom year of 1950, the zinc industry turned out 910,000 tons of slab zinc. Forty thousand tons of that and 85,000 tons from smelters' stocks went into the stockpile.

A peak total of 995,000 tons of slab zinc was shipped by smelters in 1950 as compared with 800,000 tons in '49. An estimated 150,000 tons was imported to reflect a voracious demand.

Not Equal to Task

The Institute said that producers are unable to raise output at will but must consider availability of feed material. Added auxiliary material is needed to ready reduction plant charges. Shortages also hamper procurement of handling equipment, power, fuel, and labor.

Mine production is not equal to expansion of the zinc industry. Primary slab zinc producers would need 850,000 tons of zinc concentrates to keep up the current rate of production. Makers of zinc pig-

ments need another 130,000 tons—for a total of 980,000 tons of the mine product.

But domestic mine output in 1950, including recovery from residues, was only about 617,000 tons and the current rate of concentrate imports about 230,000 tons of recoverable zinc, totaling 847,000 tons. Simple subtraction leaves a deficit of 133,000 tons. Requiring 50,000 tons of scrap, becoming more difficult to find, secondary smelters have a tough problem in bringing their spare capacity into the picture.

Problems Too Thorny

Mine production next year will narrow the gap between supply and need by producing between 660,000 to 690,000 tons. It is hoped that somehow imports can be raised to further close the gap but this may prove wishful thinking. European prices top the American and the shortage is world-wide.

To raise mine production would mean hurdling many problems. Development of existing reserves in the U. S. is hamstrung because

Steel Casting Shipments Rise

Washington—Shipments of steel castings during October totaled 150,000 tons, 15,000 tons over the September figure, according to a report by the U. S. Dept. of Commerce.

Unfilled orders for steel castings for sale to the trade at the end of October totaled 522,000 tons, 94,000 tons above the September figure.

Personnel Conference Mar. 19

New York—Aspects of modern personnel administration will be discussed at the 1951 Conference on Industrial Engineering to be held March 19-23.

Edgewater Steel Buys Tracy

Pittsburgh - Edgewater Steel Co. has acquired the Tracy Manufacturing Co., fabricator of kitchen sinks and cabinets. Purchase price reportedly was approximately \$1,500,000.

The Tracy plant has been up for sale for the last several months. Normally, the company employs between 600 and 700, but lack of steel had forced drastic cutbacks in production and employment.

Beginning Jan. 2, Edgewater will operate the plant as the Tracy Manufacturing Co. Div. of Edgewater Steel Co. Present personnel will remain intact except for Charles Wiener, president, who is resigning.

of the poorer ore quality and inflated cost of production—not appealing to risk capital. Exploration of new reserves is a lengthy and difficult process.

A follow-up on the voluntary allocation system of the zinc industry is the NPA Order M-15, which reduces the permitted use of metallic zinc for civilian consumption by 20 pct, effective Jan. 1. With defense commencing to swing a heavy-handed influence on industry, it is thought that further restrictions will be imposed.

Steel Forging Shipments Up

Washington—Shipments of commercial steel forgings for the month of October totaled 137,000 tons, exceeding the 122,000 tons shipped during the previous month, according to Dept. of Commerce figures. Unfilled orders increased 23,000 tons over the previous month to a total figure of 643,000 tons.

Nothing But Defense Work

Union, N. J.—To deal in defense work exclusively, the Hollywood and Lewis Mfg. Corp. has completed its new plant here and has purchased the assets of the Belleville Tool and Stamping Co.

Hanley Picked New Allegheny Ludlum Head Replacing Cleborne

Clark King named executive vice-president, Pierce, tech director.

Pittsburgh—Edward J. Hanley has been elected president of Allegheny Ludlum Steel Corp., succeeding E. B. Cleborne, who announced his resignation effective Dec. 31.

Clark W. King, vice-president and treasurer, was named executive vice-president and will retain his position as treasurer. Mr. Cleborne, who was elected president in December 1949, had accepted the job with the understanding that he could resign at the end of 1950. He is president of Wallingford Steel Co., a subsidiary of Allegheny Ludlum, and will devote most of his time to this job. He will continue as a director and vice-president of Allegheny Ludlum.

Frank B. Lounsberry will retire Dec. 31 as vice-president and technical director, and W. B. Pierce, manager of the company's sales development and engineering service department, will take over as technical director at that time.

H. G. Batcheller, chairman, announced that Cleborne and Lounsberry have been awarded the Allegheny Ludlum merit award. The new president is 47, joining the company in 1936 as secretary of the former Allegheny Steel Co. He was elected treasurer in 1941, vice-

president in charge of finances in 1946 and executive vice-president last December. He was named a director in 1947.

Mr. King, 43, came to Allegheny Ludlum in 1945 as executive assistant and was appointed vice-president a year later, treasurer and a director in 1949.

Mr. Lounsberry, who will continue as a director and consultant, started with Allegheny Ludlum in 1916 with the Atlas Steel Co., now the firm's Dunkirk, N. Y., plant. He has been a vice-president since 1938, and was appointed technical director in 1947.

Mr. Pierce, 43, joined Allegheny Ludlum in 1945 in his present capacity. Before that he was sales manager and, later, manager of development of Rustless Iron & Steel Co. During World War II he was chief of the WPB stainless steel division.

Wiebel Becomes President Of TCI on Retirement of Robert Gregg

Birmingham—Arthur V. Wiebel, now vice-president in charge of operations, will succeed Robert Gregg as president of the Tennessee Coal, Iron, and Railroad Co. on Jan. 1.

The U. S. Steel Corp. subsidiary also announced election of John Pugsley, now comptroller, to the newly-created post of executive vice-president. J. M. Spearman, now manager of manufacturing

operations, will fill the vacancy left by Mr. Wiebel. Hartwell A. Greene, assistant comptroller, becomes comptroller.

Coming to TCI in 1946, Mr. Wiebel became assistant to vice-president in charge of engineering and operations, U. S. Steel Corp. of Delaware. He was named vice-president in charge of operations on Jan. 1, 1947.

Mr. Gregg has twice been president of TCI and joined the firm in August, 1932 as vice-president of sales. He was chosen president on Oct. 16, 1933, served until Feb. 1, 1935 when he became vice-president in charge of sales, U. S. Steel Corp. On Jan. 1, 1938 he returned to the TCI presidency.

Indiana Harbor Works Adding 1¼ Million Tons to Ingot Output

Youngstown—A major expansion program adding 1,225,000 tons of new ingot capacity to Indiana Harbor Works was announced by Youngstown Sheet & Tube Co. Coke capacity will be increased 430,000 tons, and pig iron capacity 500,000 tons a year.

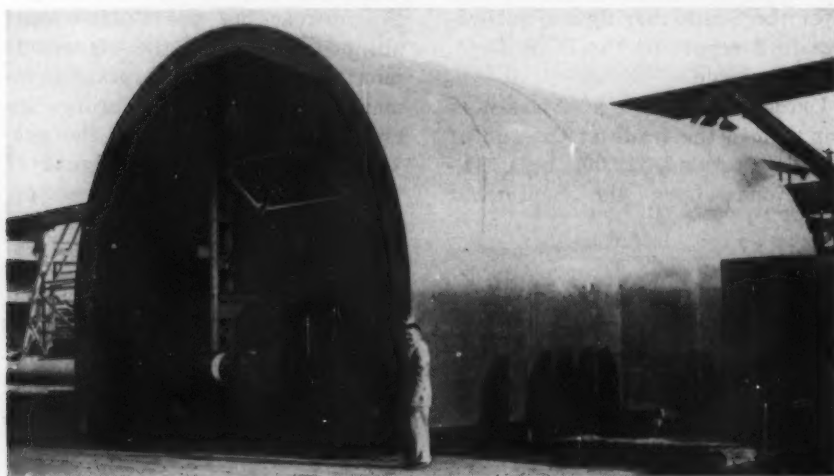
The program includes: A 75-oven battery of coke ovens; 28-ft hearth-diameter blast furnace; a 675-ft extension to the present ore yard and dock; two new ore unloaders; one turbo-blower; one steam boiler; additions to the water treating plant; a new high back pressure turbo generator and new water intake tunnel and pump house.

Four new 250-ton openhearth furnaces, in addition to the 4-furnace unit now under construction, will be built. Other units are: eight 2-hole soaking pits; one slabbing mill; new slab heating furnaces at the hot strip mill; extension to the strip mill finishing department.

The company's bessemer steel plant will be discontinued with completion of the first four new openhearth, resulting in a net increase of 925,000 tons per year.

A substantial portion of these facilities is covered by NSRB certificates of necessity.

BROADWAY TUNNEL: It looks like a Quonset hut but it's really a telescopic steel tunnel form for pouring and setting cement for San Francisco's Broadway Tunnel project. The steel form above weighs 45 tons and is 44 ft long and 28½ ft wide. It was made at the Vernon, Calif., plant of the Consolidated Western Steel Corp.

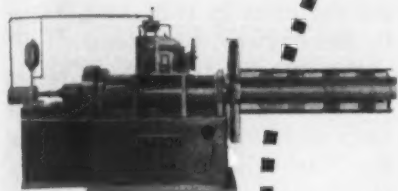


PAXSON GIVES YOU THE EDGE

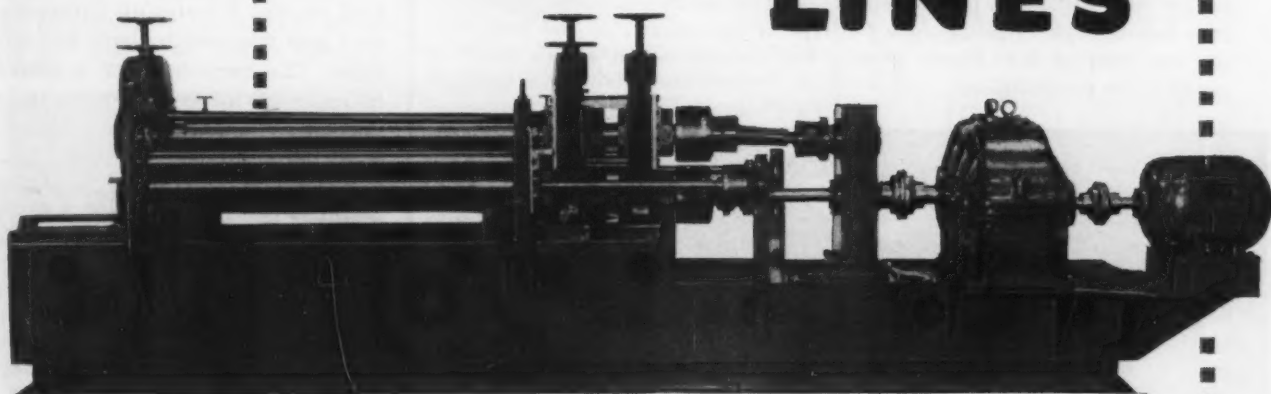
HEAVY-DUTY

Slitting

LINES



PAY-OFF REELS

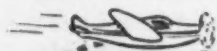


SLITTERS



COILERS

STRAIGHTENERS
SCRAP WINDERS
SCRAP CHOPPERS



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2800 ft. E.W. runway
and club house, pri-
vate field 2 miles
west of Salem, main-
tained for your conven-
ience. Wire or phone
arrival time. We will
meet your plane.

Complete PAXSON lines
are setting performance
records—*coast to coast*

Paxson Slitters are proving their efficiency for the toughest jobs, such as cutting heavy wall tubing stock and other heavy-duty slitting. Capacities up to 30,000 lb. coils. Various power, to meet requirements up to 1½" total metal thickness. Paxson also builds general duty lines.

Whatever your slitting requirements — contact Paxson.

PAXSON MACHINE CO.
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Engineers and Builders of Cold-Rolled Strip-Mill Equipment
SPECIALIZING IN SLITTING LINES

REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT

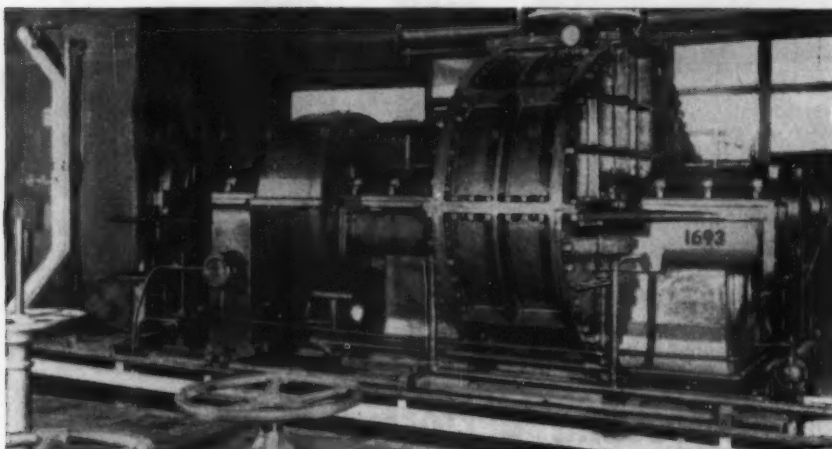
NEW R-C EXHAUSTER

pays its own way

By replacing a 30-year-old battery of three steam-driven gas exhausters with a new, high-capacity, electrically-driven R-C unit, important advantages were gained, in a large industrial plant:

1. The one new unit carries the base load.
2. Steam needed for 5 other steam-driven exhausters, carrying partial load, is substantially reduced because of slower speeds.
3. Heat balance in the plant is maintained.
4. Savings in total power cost will pay for the new installation in about one year.

These very satisfactory results were obtained by careful evaluation of all the factors before deciding upon the type of equipment . . . and then by specifying an R-C Rotary Positive Gas Exhauster that will do the work at low operating cost.

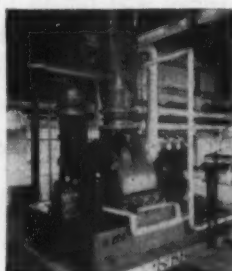


Even though your equipment to handle gas or air may still have years of life, it may be sound economy to replace it with modern, efficient, R-C units of the right type, size and drives to best meet your needs. Our engineers will help you analyze your problem and make unbiased recommendations of either Rotary Positive or Centrifugal equipment, depending upon your specific conditions. This dual choice is an exclusive R-C advantage.

With capacities from 5 cfm to 100,000 cfm, R-C units can be closely matched to work requirements, for dependable, economical performance. At Roots-Connersville, almost a century of blower building experience is at your service, without obligation.

ROOTS-CONNERSVILLE BLOWER CORP.
151 Ohio Avenue, Connersville, Indiana

Type RCGH Rotary Positive Gas Exhauster, driven by 450 hp synchronous motor. Capacity, 20,600 cfm.



2-stage Centrifugal Exhauster for coke oven plant of Canadian steel mill. Capacity 16,340 cfm.

ROOTS-CONNERSVILLE

ONE OF THE DRESSER INDUSTRIES



Pittsburgh Steamship Co. Moves 30,000 Tons of Ore in '50

Chicago—The Pittsburgh Steamship Co. moved about 30,000 gross tons of ore for iron and steelmaking facilities in 1950, said Walter C. Hemingway, president.

An all-time peacetime record for ore shipments was set at the Gary and South Chicago works of the Carnegie-Illinois Steel Corp. this year where a total of 12,714,000 gross tons were shipped. More than 75 pct of this was carried by the Pittsburgh Steamship fleet and the rest by contract carriers. The records were achieved in spite of adverse weather conditions which hampered normal operations and cut down the length of the shipping season.

Allis-Chalmers Raises Wages

Milwaukee — Wage increases, ranging from 10¢ an hr to 8 pct for certain salary groups, have been announced by the Allis-Chalmers Mfg. Co. for its 31,000 employees in its nine plants throughout the country. The wage and salary increases, effective Dec. 11, will add \$6.5 million to the company's payroll. Changes in the national economy since labor contracts were signed earlier this year made the wage and salary adjustments advisable at the present time, according to Walter Geist, president of the company.

Keel Set for New Ore Carrier

Lorain, Ohio—The first keel section for a huge new ore carrier, one of three to be built in the shipbuilding program of the Pittsburgh Steamship Co., has been set in place. The program will include three ore carriers and repowering of two other ore boats. An additional 2,310,000 tons of iron ore a year will be carried. Capacity of the new ships will be 19,600 tons. A construction feature of the new boats will be the 96,000 lb casting for the stern frame and rudder section.

production ideas

Continued from Page 40

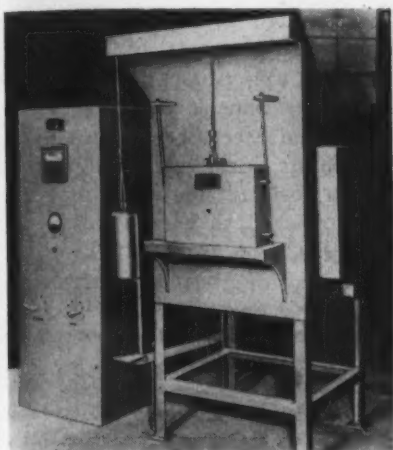
centrated load capacity of 500 lb, distributed load capacity of 1500 lb. Searchlights on both ends provide light for night operation. *Sage Equipment Co.*

For more data insert No. 26 on postcard, p. 37.

Heat Treating Furnaces

Designed for heavy and continuous duty at heat levels up to 2500°F.

Each of the FG series general purpose electric furnaces has a separate, matching control panel unit, complete with indicating controller, transformer, current input meter with pushbutton reading, and magnetic contactor. The units are equipped with Globar heating



elements and the voltage regulating type transformer with 36 taps on multiple dead-front switches maintains a constant rate of heating. The furnace case is heavy steel, electrically welded, with thick, super-duty type insulation. The door is counterbalanced, and raised and lowered by a foot pedal. *Pereny Equipment Co.*

For more data insert No. 27 on postcard, p. 37.

Multi-Purpose Grease

Highly versatile as it resists high heat, cold or wet conditions.

A new oxidation inhibited multi-purpose grease, Cosmolube, is a cold-milled grease said to have very smooth texture, with excellent oxidation stability. It clings well to all metal surfaces, reducing leakage to the barest minimum. Cosmolube is available in two consistencies, NLGI Nos. 1 and 2. *E. F. Houghton & Co.*

For more data insert No. 28 on postcard, p. 37.

Parts Cleaning Tank

Overcomes cleaning problems by recharging with proper solvent.

The SolVoJet handles petroleum, emulsion, and light compound solutions as well as toxic and non-toxic



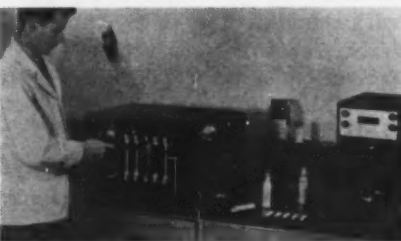
solvents. Soil is removed by room temperature solvent action and the pressure jet required to dislodge stubborn particles is supplied by a rotary pump operated by a foot switch. An adjusting valve permits quick regulation of the pressure. *Phillips Mfg. Co.*

For more data insert No. 29 on postcard, p. 37.

Induction Carbon Unit

Self-contained unit determines carbon in steel in 2½ min.

Savings up to 75 pct in the time required for making a determination of carbon in steel is claimed for the new induction carbon apparatus. It also eliminates personal discomfort due to working with the conventional furnace. Carbon determinations are said to be made routinely with the apparatus in 2½ min. The instrument handles a wide variety of steel alloys with carbon contents



ranging from 0.072 to 5.10 pct. It operates on 230 v, 50-60 cycle ac and is furnished with necessary chemicals. *Fisher Scientific Co.*

For more data insert No. 30 on postcard, p. 37.

Periphery Press Holder

Developed for marking the outer circumference of small diam parts.

The new Model PPH-10 holder is custom made for each job, with

News about

UNICHROME

COATINGS
for METALS

METALLIC • ORGANIC
DECORATIVE • PROTECTIVE

HOW TO EASE METAL SHORTAGE HEADACHES

Here are three ways you can ease the production pinch caused by shortages in metal finishing materials:



Copper can save nickel

Where your specifications call for plating copper and nickel prior to chromium, a decrease in the thickness of nickel with a compensating increase in copper will still give you a product with good corrosion resistance. Unichrome Pyrophosphate Copper Plating Process is especially suited for this job, since it yields a smooth, fine-grained dense deposit that needs little buffing, if at all.

Conserve chromium while increasing output

Hundreds of companies using Unichrome S.R.H.S. Chromium Solution have been benefiting by high speed chromium plating. Today, with shortages, this bath is all the more valuable in sustaining production. Since more dilute S.R.H.S. baths can be used, appreciable amounts of chromic acid are conserved. One company, in fact, saves as much as 25%.

Where it pays to cut plating thickness



All-metal finishes supply best wear resistance. But in many cases, where products are plated mainly for appearance and don't get much handling, a thinner deposit followed by application of a clear Unichrome lacquer or synthetic will do the job. The result: You save metal supplies and still turn out a high quality product.

UNITED CHROMIUM, INCORPORATED

100 East 42nd St., New York 17, N. Y.
Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif.
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United Chromium Limited, Toronto, Ont.



the demand for
**HIGHER
PRODUCTION**
calls for more attention
to *Cutting Fluids*

★ **PRODUCTION INCREASED FROM 18 TO 31 PIECES PER HOUR** machining pipe union from 18-8 stainless steel in single spindle automatic after changing over to Stuart's THREDKUT 99.

★ **SPEEDS, FEEDS INCREASED 50%** turning, drilling, facing, reaming, tapping forged steel valve bodies (equivalent SAE 1315) on turret lathe after applying Stuart's SOLVOL water soluble cutting fluid concentrate. And, excessive scrap loss due to high finish requirements was eliminated.

★ **PRODUCTION DOUBLED** boring 7½" dia. hole through 11" dia. x 30½" long solid forged 5060 steel pump liner through use of Stuart's SPEEDKUT B the multi-purpose cutting fluid.

● These are not isolated examples of how Stuart can help boost production. They are taken from daily field reports. Ask to have a Stuart Representative call. Send for your copy of "CUTTING FLUID FACTS."

D. A. Stuart Oil Co.

2737 S. Troy Street, Chicago 23, Ill.

production ideas

Continued

the radius, size and number of characters determined by the piece to be stamped. Made with shank size to fit any press, the holder uses regular straight sided type. A removable plastic side plate holds the type firmly in place. *M. W. Cunningham Co.*

For more data insert No. 31 on postcard, p. 37.

Portable Vacuum Cleaner

Small unit incorporates heavy duty advantages of larger machines.

The new cleaner is a 1½ hp machine that operates one 35-ft length of vacuum cleaning hose. Overall dimensions are compact, to permit maneuverability in narrow aisles or congested areas. Width is 21½ in.; length, 40½ in., and height, 43¼



in. Dust container is released by quick-acting lever and is equipped with handles for easy emptying. *U. S. Hoffman Machinery Corp.*

For more data insert No. 32 on postcard, p. 37.

Ball-Bearing Center

Free of chatter, husky, simple; takes heavy radial and thrust loads.

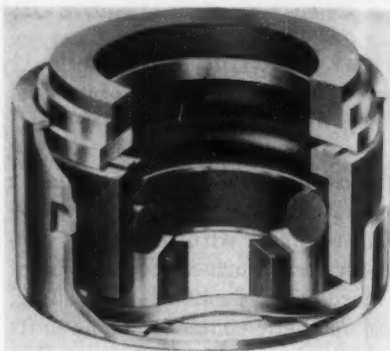
The new center has a double row of sealed, lubricated-for-life ball bearings to take exceptionally heavy radial and thrust loads. It is said to be accurate and runs true because the center socket is drilled and machined after assembly. The shank has a No. 2 Morse taper. The unit is supplied with three replaceable centers and a wrench. *Delta Power Tool Div., Rockwell Mfg. Co.*

For more data insert No. 33 on postcard, p. 37.

Mechanical Shaft Seal

Balanced pressure seals complete in one package, factory assembled.

To meet the shaft sealing needs of pump manufacturers, FCB and GCB Sealol balanced pressure seals are offered. No special machining is required when Sealol seals are



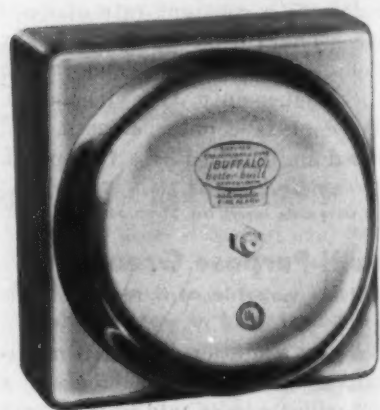
used. Rubber friction members, incorporated in the rotating and stationary elements of the seals, provide the proper driving and holding actions. The design permits hand assembly of the seal in the pump. Seals are built of corrosion resistant materials, and can be furnished to handle water, oil, kerosene, and gasoline. They are available for shaft sizes from ¾ to 1½ in. *Sealol Corp.*

For more data insert No. 34 on postcard, p. 37.

Fire Alarm

Automatically sounds 5 min warning when the temperature reaches 135°.

The Buffalo fire alarm is a completely automatic, independent, self-contained unit. Its rust-proof,



windup mechanism stays energized until excessive temperature releases the heat-sensitive fuse. The fire alarms are easy to install on wall or ceiling. *Buffalo Fire Appliance Corp.*

For more data insert No. 35 on postcard, p. 37.
Resume Your Reading on Page 41

IRON AGE *markets and prices*

*market
briefs
and
bulletins*

plate demand—The demand for plates seems to be coming abreast that of sheets, at least as far as DO orders and allocations are concerned. Some people in the industry are afraid that a shipbuilding program for cargo vessels will be undertaken in the coming year. This will put an enormous strain on plate production. Although there are a great many cargo vessels in reserve the majority of them are too slow to be of much use during war. Therefore they believe a new program will be started to build more cargo vessels. Other quarters believe the problem can be overcome by installing new propulsion units in them.

pipe lack—One company reports that at the beginning of this year they were actively soliciting the oil companies to buy more pipe and were turned down. They then sold their entire tonnage of seamless pipe for 1951 to utility and gas companies. Now the oil companies are trying to get on the books for it but they are all filled up. However, it is felt that oil companies will eventually get what they need under an allocation program.

borosil and siminal—Price increases on borosil and siminal have been announced by Ohio Ferro-Alloys Corp. Siminal, in bulk lump, carload lots, is now 14½¢ per lb; ton lots, 15¼¢ per lb; less than ton lots, 16¼¢ per lb. Borosil of 3 to 4 pct boron content and 40 to 45 pct silicon content, is now \$5.25 per pound of contained boron delivered.

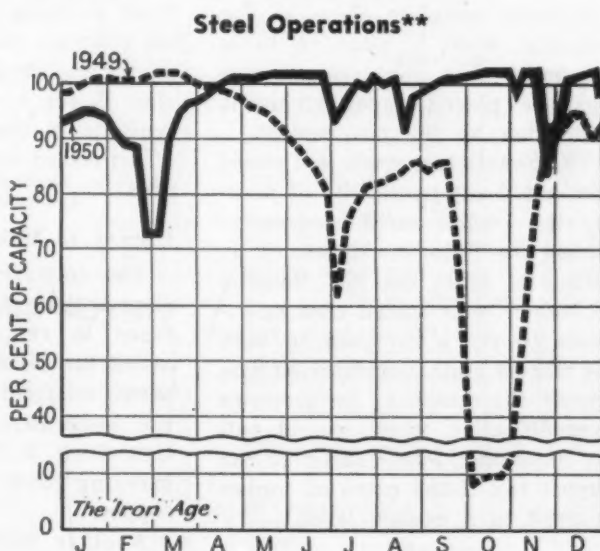
gray iron casting prices—Current casting prices of Hamilton Foundry & Machine Co. will cover shipments through Dec. 31. New individual prices for active parts are being computed and will be quoted for shipments beginning January 1. Prices will no longer be quoted for a fixed period, and will be those in effect at the time of shipment.

cold-finished bar extras—Columbia Steel & Shafting Co. has increased size extras on the smaller sizes of its cold finished carbon rounds from \$1 to \$4.

scrap metal controls—The scrap industry is expecting price controls on scrap metals early in 1951. The Economic Stabilization Agency will meet again with the trade on Jan. 2—after which a decision on price controls will be made. Signs point to a modernized version of the old OPA maximum price Reg. 4. Railroads were ordered by ESA to stop scrap sales until they can give ESA a week's notice of prices to be charged on planned sales. ESA also regards new formula prices as satisfactory for freezing, it is said.

appliances go up—Norge Div. of Borg-Warner Corp., announced price increases last week ranging from 3 to 10 pct, affecting the household appliance products in the division's new 1951 lines. Increased manufacturing costs were given as the reason.

brake beam channels—Freight car builders are running into trouble trying to get enough brake beam channels. Since they are not rolled regularly every month some car builders get caught short and have to slow down production until they can get them.



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Dec. 17	100.0*	105.0	86.0*	96.0	101.4	104.0	101.5*	103.0	104.0	106.0	92.5	90.5	116.0	101.0
Dec. 24	101.0	104.0	88.5	90.0	91.4	94.0	96.5	99.0	103.0	106.0	90.6	80.5	106.0	97.0

* Revised.

** Steel operations for the first half of 1950 are based on annual capacity of 99,392,800 net tons. Beginning July 1, 1950 operations are based on new annual capacity of 100,593,500 net tons.

nonferrous metals

outlook and
market activities

NONFERROUS METALS PRICES

	Dec. 20	Dec. 21	Dec. 22	Dec. 23	Dec. 25	Dec. 26
Copper, electro, Conn.	24.50	24.50	24.50	24.50	....	24.50
Copper, Lake, delivered	24.625	24.625	24.625	24.625	....	24.625
Tin, Straits, New York	\$1.50	\$1.485	\$1.50*	....	....	\$1.50*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	....	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	....	16.80

Note: Quotations are going prices.

*Tentative.



by *r. hatschek*

New York—Dealers are selling little, if any, copper scrap for delivery in January because they feel that present refinery prices are too low. There is some feeling in the trade that voluntary price controls will not work for the scrap metals industry.

These people are afraid that if any competition develops for material, prices will just go wild and cause complete chaos in the industry. What it adds up to is the belief that nonferrous scrap must be placed under stringent regulation by the government.

The Senate last week just about eliminated any possibility of passing the copper tariff suspension during the "lame duck" session by voting to table the bill. Senator McMahon later stated that he intends to try a compromise with the mining state congressmen who oppose the measure. He proposes a modification which would call for automatic reimposition of the import tax if the price of copper dropped to a certain level.

New Copper Order Expected

The National Production Authority's copper conservation order, now being drafted, is not expected to be released until the latter part of this week. The order will sharply cut into household appliances, according to NPA, but use in these items as

an electrical conductor will not be further curtailed.

The metal markets were all quiet late last week because of the Christmas holiday and in anticipation of further NPA control orders and price controls.

The electric fuse industry last week requested NPA assistance in getting necessary supplies of zinc and copper for the manufacture of their products. They pointed out the essential character of their industry and stated that the base period chosen by the NPA was unrealistic in that it was a period of depressed volume in their business.

Harvey to Make Aluminum

The industry committee mentioned that the use of zinc in fuses is required by law and asked the NPA if they might be exempted from order M-15 and at the same time requested exemption from M-12 so that current carrying parts might be made of copper.

Another 72,000 tons of annual aluminum capacity will be added by mid-1952 with the entrance into the industry of Harvey Machine Co. of Torrance, Calif. Site of the new plant is to be Kalispell, Mont. Private financing is planned but, according to General Services Administrator Jess Larson, some government funds may be used

under the Defense Production Act if they are necessary.

Because the firm is new in the industry, it will be required to sell only 25 pct of its output in the open market. Other producers have already agreed to sell up to two-thirds of their production on the open market for a 5-year period and 25 pct to users who have no reduction facilities for 15 years thereafter.

This addition brings the total proposed new facilities of the aluminum industry to 392,000 tons which should all be in operation sometime in 1952. At that time, the nation should be able to produce at an annual rate of about 1,100,000 tons of aluminum per year. This compares with a war-time peak of 920,179 tons produced in 1943 and approximately 720,000 tons this year.

Increases Total 471,000 Tons

The breakdown of the industry's expansion is: Aluminum Co. of America, 120,000 tons; Reynolds Metals Co., 100,000 tons; Kaiser Aluminum and Chemical Co., 100,000 tons; and Harvey Machine, 72,000 tons. The figure is also bolstered by an additional 79,000 tons of capacity being reactivated by Alcoa which brings the total to 471,000 tons, very close to the government's requested 500,000 ton boost.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.6¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.32 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate: ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to 11.1¢; 36 to 38, 47.2¢ to 11.7¢.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 2S-F, 37.5¢ to 33.5¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-TS, ¼ to 1 1/32 in., 53.5¢ to 42¢; ½ to 1 ½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 38¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 6S-T5, OD in. 1 ¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., \$1.142; 96 in., \$1.522; 120 in., \$1.902; 144 in., \$2.284. Gage 0.024 in. x 28 in., 72 in., \$1.379; 96 in., \$1.839; 120 in., \$2.299; 144 in., \$2.759. Coiled Sheet: 0.019 in. x 28 in., 23.2¢ per lb.; 0.024 in. x 28 in., 26.9¢ per lb.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FSI-O, ¼ in. 63¢; 3/16 in. 46¢; ½ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 75¢; 16, 86¢; 18, 93¢; 20, \$1.05; 22, \$1.27; 24, \$1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M. diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1 ¼ to 1.749 in., 53¢; 2 ½ to 5 in., 48.5¢. Other alloys higher. Base: Up to ¼ in. diam, 10,000 lb; ¼ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. in weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ¼ lb, 10,000 lb; ¼ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, \$1.40; 5/16 to ¾, \$1.26; ¾ to 1, \$1.26; 1 to 2 in., 76¢; 0.165 to 0.219, ¾ to 1, \$1.17; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in. in., Up to 1 ½ in., 10,000 lb; 1 ½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb. base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

Nickel and Monel

(Base prices, f.o.b. mill)

"A" Nickel Monel
Sheets, cold-rolled 74 58
Strip, cold-rolled 80 62
Rods and bars 70 56
Angles, hot-rolled 70 56
Plates 72 57
Seamless tubes 103 93
Shot and blocks 51

Copper, Brass, Bronze

(Freight prepaid on 200 lb includes duty)

	Sheets	Rods	Extruded Shapes
Copper	41.03		40.63
Copper, h-r		36.88	
Copper, drawn		35.18	
Low brass	39.15	38.84	
Yellow brass	38.28	37.97	
Red brass	40.14	39.83	
Naval brass	43.08	38.61	38.07
Landed brass		32.63	36.70
Comm'l bronze	41.13	40.82	
Mang. bronze	45.96	40.65	41.41
Phos. bronze	60.20	60.45	
Muntz metal	40.43	36.74	37.99
Ni silver, 10 pct	49.27	51.49	
Arch. bronze			35.11

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 19.00
Aluminum pig 18.00
Antimony, American, Laredo, Tex. 32.00
Beryllium copper, 3.75-4.25% Be. \$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be \$69.00
Bismuth, ton lots \$2.25
Cadmium, del'd \$2.55
Cobalt, 97-99% (per lb) \$1.80 to \$1.87
Copper, electro, Conn. Valley 24.50
Copper, Lake, delivered 24.625
Gold, U. S. Treas., dollars per oz. \$35.00
Indium, 99.8%, dollars per troy oz. \$2.25
Iridium, dollars per troy oz. \$200
Lead, St. Louis 16.80
Lead, New York 17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb 24.50
Magnesium, sticks, 100 to 500 lb 42.00 to 44.00
Mercury, dollars per 76-lb flask f.o.b. New York \$137 to \$142
Nickel, electro, f.o.b. New York 53.55
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel 46.75
Palladium, dollars per troy oz. \$24.00
Platinum, dollars per troy oz. \$90 to \$93
Silver, New York, cents per oz. 80.00
Tin, New York 31.50
Titanium, sponge 55.00
Zinc, East St. Louis 17.50
Zinc, New York 18.22
Zirconium copper, 50 pct 36.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot
No. 115 29.00
No. 120 28.50
No. 123 28.00
80-10-10 ingot
No. 305 35.00
No. 315 32.00
88-10-2 ingot
No. 210 47.50
No. 215 44.50
No. 245 37.00
Yellow ingot
No. 405 25.50
Manganese bronze
No. 421 32.75

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys
0.30 copper, max. 33.75-34.25
0.60 copper, max. 33.50-34.00
Piston alloys (No. 122 type) 31.50-32.00
No. 12 alum. (No. 2 grade) 30.75-31.25
108 alloy 31.25-31.75
195 alloy 32.75-33.25
13 alloy 34.00-34.50
ASX-679 31.25-31.75

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 ½ % 32.50-33.00
Grade 2—92-95 % 30.75-31.50
Grade 3—90-92 % 30.00-30.50
Grade 4—85-90 % 29.50-30.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper
Cast, oval, 15 in. or longer 39 ¼
Electrodeposited 33 ½
Rolled, oval, straight, delivered 38 ½
Forged ball anodes 43
Brass, 80-20
Cast, oval, 15 in. or longer 34 ¼
Zinc, oval 26 ¼
Ball anodes 25 ½
Nickel 99 pct plus
Cast 70.50
Rolled, depolarized 71.50
Cadmium \$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn. 79 ½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 52.15
Copper sulfate, 99.5 crystals, bbl. 12.85
Nickel salts, single or double, 4-100 lb bags, frt allowed 20 ¼
Nickel chloride, 375 lb drum 27 ¼
Silver cyanide, 100 oz lots, per oz. 67 ¼
Sodium cyanide, 96 pct domestic 200 lb drums 19.25
Zinc cyanide, 100 lb drums 45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ¼¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22 ¼
Yellow brass	20 ¼	18 ¼
Red brass	21 ¼	20 ¼
Comm. bronze	21 ¼	21
Mang. bronze	19 ¼	18 ¼
Brass rod ends	19 ¼	19 ¼

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.00
No. 2 copper wire	20.00
Light copper	19.00
Refinery brass	18.50*
Radiators	15.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	21.00
No. 2 copper wire	20.00
Light copper	19.00
No. 1 composition	20.00
No. 1 comp. turnings	19.75
Rolled brass	18.50
Brass pipe	18.50
Radiators	15.25
Heavy yellow brass	15.00

	Aluminum
Mixed old cast	20
Mixed old clips	21
Mixed turnings, dry	19 ½
Pots and pans	20
Low copper	22 ½

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	19 ½-20
No. 2 heavy copper and wire	18-18 ½
Light copper	17-17 ½
New type shell cuttings	17-17 ½
Auto radiators (unsweated)	14 ½-15
No. 1 composition	17-17 ½
No. 1 composition turnings	16 ½-17
Clean red car boxes	15 ½-16
Cocks and faucets	15 ½-16
Mixed heavy yellow brass	13-13 ½
Old rolled brass	14-14 ½
Brass pipe	17-17 ½
New soft brass clippings	17 ½-18
Brass rod ends	16 ½-17
No. 1 brass rod turnings	16-16 ½

Aluminum

Alum. pistons and struts	12 ½-13
Aluminum crankcases	15 ½-16
2S aluminum clippings	19-19 ½
Old sheet and utensils	15 ½-16
Borings and turnings	13
Misc. cast aluminum	15 ½-16
Dural clips (24S)	15 ½-16

Zinc

New zinc clippings	14 ½-15
Old zinc	11-11 ½
Zinc routings	8 ½-9
Old die cast scrap	8-8 ½

Nickel and Monel

Pure nickel clippings	60-65
Clean nickel turnings	57-60
Nickel anodes	60-65
Nickel rod ends	60-65
New Monel Clippings	22-25
Clean Monel turnings	18-20
Old sheet Monel	20-22
Inconel clippings	26-28
Nickel silver clippings, mixed	13-14
Nickel silver turnings, mixed	12-13

Lead

Soft scrap, lead	15-15 ½
Battery plates (dry)	8 ½-9

Magnesium

Segregated solids	9-10
Castings	6 ½-6 ¾

Miscellaneous

Block tin	88-90
No. 1 pewter	63-65
No. 1 auto babbitt	53-60
Mixed common babbitt	12 ½-12 ¾
Solder joints	18 ½-19
Siphon tops	58-60
Small foundry type	16 ½-17 ½
Monotype	14 ½-15
Lino. and stereotype	14 ½-14 ¾
Electrotype	12 ½-13
Hand picked type shells	11 ½-11 ¾
Lino. and stereo. dross	8-8 ½
Electro. dross	6 ¼-6 ¾

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(cents per pound)				
Hot-rolled sheets	3.60	3.60	3.35	3.35
Cold-rolled steels	4.35	4.35	4.10	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.40	4.40
Hot-rolled strip	3.50	3.50	3.25	3.25
Cold-rolled strip	4.75	4.75	4.21	4.18
Plate	3.70	3.70	3.50	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R-strip (No. 302)	36.50	36.50	34.50	33.00

Tin and Terneplate:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.50	\$7.50	\$7.50	\$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65

Bars and Shapes:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(cents per pound)				
Merchant bars	3.70	3.70	3.45	3.45
Cold finished bars	4.55	4.55	4.15	3.995
Alloy bars	4.30	4.30	3.95	3.95
Structural shapes	3.65	3.65	3.40	3.25
Stainless bars (No. 302)	31.25	31.25	30.00	28.50
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(cents per pound)				
Bright wire	4.85	4.85	4.50	4.50

Rails:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(dollars per 100 lb)				
Heavy rails	3.60	\$3.60	\$3.40	\$3.40
Light rails	4.00	4.00	3.75	3.75

Semifinished Steel:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(dollars per net ton)				
Rerolling billets	\$56.00	\$56.00	\$54.00	\$53.00
Slabs, rerolling	56.00	56.00	54.00	53.00
Forging billets	66.00	66.00	63.00	63.00
Alloy blooms billets, slabs	70.00	70.00	66.00	66.00

Wire Rod and Skelp:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(cents per pound)				
Wire rods	4.10	4.10	3.85	3.85
Skelp	3.35	3.35	3.15	3.15

Composite Prices

Finished Steel Base Price

Dec. 26, 1950	4.131¢ per lb.
One week ago	4.131¢ per lb.
One month ago	3.837¢ per lb.
One year ago	3.836¢ per lb.

	High	Low
1950....	4.131¢ Dec. 1	3.837¢ Jan. 3
1949....	3.837¢ Dec. 27	3.3705¢ May 3
1948....	3.721¢ July 27	3.193¢ Jan. 1
1947....	3.193¢ July 29	2.848¢ Jan. 1
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1
1945....	2.464¢ May 29	2.396¢ Jan. 1
1944....	2.396¢	2.396¢
1943....	2.396¢	2.396¢
1942....	2.396¢	2.396¢
1941....	2.396¢	2.396¢
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939....	2.35367¢ Jan. 3	2.26689¢ May 16
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935....	2.07542¢ Oct. 1	2.06492¢ Jan. 8
1932....	1.89196¢ July 5	1.83910¢ Mar. 1
1929....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*

Pig Iron:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(per gross ton)				
No. 2, foundry, del'd Phila.	\$57.77	\$57.77	\$54.77	\$50.42
No. 2, Valley furnace	52.50	52.50	49.50	46.50
No. 2, Southern Cin'ti.	55.58	55.58	52.58	46.08
No. 2, Birmingham	48.88	48.88	45.88	39.38
No. 2, foundry, Chicago†	52.50	52.50	49.50	46.50
Basic del'd Philadelphia..	56.92	56.92	53.92	49.92
Basic, Valley furnace....	52.00	52.00	49.00	46.00
Malleable, Chicago†	52.50	52.50	49.50	46.50
Malleable, Valley	52.50	52.50	49.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese†	181.20	181.20	181.20	173.40

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

†Average of U. S. prices quoted on Ferroalloy page.

Scrap:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(per gross ton)				
Heavy melt'g steel, P'gh..	\$46.13	\$46.13	\$43.75	\$29.75
Heavy melt'g steel, Phila.	44.50	44.50	38.75	23.50
Heavy melt'g steel, Ch'go	44.75	44.75	39.75	26.50
No. 1 hy. com. sh't, Det..	40.25	44.13	41.25	26.50
Low phos. Young'n....	48.63	48.63	46.25	31.75
No. 1 cast, Pittsburgh	67.75	67.75	60.75	38.50
No. 1 cast, Philadelphia..	62.50	62.50	56.50	37.00
No. 1 cast, Chicago	65.00	65.00	62.00	38.50

Coke: Connellsville:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(per net ton at oven)				
Furnace coke, prompt...	\$14.25	\$14.25	\$14.25	\$14.00
Foundry coke, prompt...	17.25	17.25	16.75	15.75

Nonferrous Metals:	Dec. 26, 1950	Dec. 19, 1950	Nov. 28, 1950	Dec. 27, 1949
(cents per pound to large buyers)				
Copper, electro, Conn....	24.50	24.50	24.50	18.50
Copper, Lake, Conn....	24.625	24.625	24.625	18.625
Tin Straits, New York..	\$1.50†	\$1.55*	1.405	78.00
Zinc, East St. Louis....	17.50	17.50	17.50	9.75
Lead, St. Louis	16.80	16.80	16.80	11.80
Aluminum, virgin	19.00	19.00	19.00	17.00
Nickel, electrolytic	53.55	53.55*	51.22	42.97
Magnesium, ingot	24.50	24.50	24.50	20.50
Antimony, Laredo, Tex...	32.00	32.00	32.00	32.00

†Tentative. *Revised.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

Pig Iron

\$52.69 per gross ton....
52.69 per gross ton....
49.69 per gross ton....
45.88 per gross ton....

Scrap Steel

\$45.13 per gross ton....
45.13 per gross ton....
40.75 per gross ton....
26.58 per gross ton....

High	Low	High	Low
\$52.69 Dec. 12	\$45.88 Jan. 3	\$45.13 Dec. 19	\$26.25 Jan. 3
46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24
23.61	23.61	\$19.17	\$19.17
23.61	23.61	19.17	19.17
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

SCRAP *iron and steel*

*markets
prices
trends*

ESA's New Year resolution to impose mandatory price controls on scrap holds spotlight . . . Takes steam out of all markets.

Washington has made a New Year resolution to clamp mandatory controls on scrap at present formula prices. Pipelines into the capital were filled with news of scrap trade meetings with the Economic Stabilization Agency. Jan. 2 is regarded as a fateful day for the industry. Following an ESA meeting on that day decision will be made on price controls.

ESA met last week with scrap users, dealers, and with railroads, which produce a lot of scrap, to arrange the settings for the Jan. 2 meeting. Indicated is a streamlined model of the old OPA maximum price Reg. 4. Present formula prices are regarded by ESA as satisfactory for chilling.

ESA means business. Last Friday it asked railroads to stop all sales of scrap metal until they are able to give ESA 7 days' notice of the price to be charged on any contemplated sale. ESA would thus have one week in which to freeze or roll back prices if quotations prove rambunctious.

The holidays and 'the waiting-for-Washington attitude took the ginger out of all scrap markets last week. The Pittsburgh trade expected that cast and railroad specialties would be rolled back. In Detroit last week, signs were pointing to a return to the straight formula range.

PITTSBURGH—Mandatory controls on scrap at about the present formula prices are looked for shortly after the first of the year. Cast grades and railroad specialties probably will be rolled back. Consumers and brokers got that impression in meetings with ESA officials last week. Final decision will not be made until after a

joint session with ESA on Jan. 2.

Meanwhile it was understood adherence to the existing formula will be considered compliance on a voluntary basis. The market continued quiet. Mills were in good shape on inventory, although foundries were reported finding it difficult to get enough for their needs.

CHICAGO—The scrap market in the Chicago area showed definite signs of weakness this week. Consumers are out of the market for short shovelings turnings and machine shop turnings are reacting sympathetically. Broker offerings on turning grades have dropped several dollars per gross ton. Consumer prices on railroad items, cast and low phos grades are expected to come down. New sales are difficult to make. Dealers, brokers and consumers are sitting on the sidelines waiting to see at what level prices will stabilize.

PHILADELPHIA—There was very little activity in the scrap market here this week because of the Christmas holiday and a wait-and-see attitude concerning the nature of coming price controls. There were no price changes. Practically everyone is expecting to see some sort of roll-back, particularly in the cast grades. The holiday and the weather are both cutting into scrap making operations.

NEW YORK—Prices in this market remained at last week's levels. The holidays and uncertainty of what would come from the ESA meetings with scrap users and dealers combined to check any price rises. Shipping on old orders was reported as good but other sources noted a quietness and expectancy in the market. It was reported that some cast scrap consumers were hesitant to buy on the assumption that prices would be rolled back soon. Mandatory controls were expected.

DETROIT—As we go to press all indications point to a return to formula prices here within a few days. Dealer shipments are high and there is a definite weakness in Detroit prices. For the first time in several months actual shipment of free scrap at formula prices have been reported. In view of the marked reduction in scrap sales over the formula and the strong indication that all sales will shortly be at formula prices, the price above the formula which has been carried in Detroit for the past several months has been eliminated.

CLEVELAND—Between holidays and the probability of price controls, the scrap market here and in the Valley was in a subdued state this week. Shipments, which have been improving despite adverse weather, are seasonally off and the present inactive market will probably carry over into January.

Scrap is moving at formula and some consumers are being offered good unprepared tonnage, indicating a possible desire to get out from under inventory before controls are slapped on the market. Some upgrading continues. Best guess here is that controls will be imposed before Feb. 1, and will hit foundry grades and rails hard.

ST. LOUIS—Due to the uncertainty following the ESA order plus the Christmas holiday lull there was no trading in scrap iron in the St. Louis industrial district. Prices are unchanged but foundry grades are said to be easier as a result of the feeling that these prices might be rolled back.

CINCINNATI—The market here is in a holiday lull. Price control talk of the past week put the spotlight on the high prices of foundry grades and as a result, a little scare has developed here. Buyers are playing it safe and there has been a slowdown in buying, but prices are unchanged.

This is probably just as well, according to brokers, because there isn't enough good foundry tonnage to go around in an active market anyway. Openhearth grades are strong at the formula. Consumers are comfortable but not turning anything down.

BIRMINGHAM—The district's biggest scrap buyer was back in the market again this week and the effect of this buying was reflected in higher prices for several items. No. 1 heavy melting rose to a new price of \$42.50 to \$43.50, and bar crops and plates moved up \$1 to \$47 to \$48.

BOSTON—Considerable activity was noted in the market this week. There is plenty of talk of scrap being sold at above-formula prices with No. 1 bundles going as low as \$1 rise in the price of No. 1 machinery cast, brought the current price to \$49 to \$50.

BUFFALO—Due to an early press deadline Buffalo scrap price changes received last week could not be included. Those changes were: No. 1 machinery cast, \$59 to \$60; No. 1 cupola cast, \$54 to \$55.

Pittsburgh

No. 1 hvy. melting	\$45.75 to \$46.50
No. 2 hvy. melting	43.75 to 44.50
No. 1 bundles	45.75 to 46.50
No. 2 bundles	42.75 to 43.50
Machine shop turn.	37.75 to 38.50
Mixed bor. and ms. turns.	37.75 to 38.50
Shoveling turnings	39.75 to 40.50
Cast iron borings	39.75 to 40.50
Low phos. plate	56.00 to 56.50
Heavy turnings	46.50 to 47.00
No. 1 RR. hvy. melting	45.75 to 46.50
Scrap rails, random lgth.	64.50 to 65.00
Rails 2 ft and under	68.00 to 69.00
RR. steel wheels	63.00 to 64.00
RR. spring steel	63.00 to 64.00
RR. couplers and knuckles	63.00 to 64.00
No. 1 machinery cast	67.50 to 68.00
Mixed yard cast	57.50 to 58.00
Heavy breakable cast	52.50 to 53.00
Malleable	71.00 to 72.00

Chicago

No. 1 hvy. melting	\$44.50 to \$45.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 factory bundles	44.00 to 45.00
No. 1 dealers' bundles	44.00 to 45.00
No. 2 dealers' bundles	41.00 to 42.00
Machine shop turn.	36.00 to 37.00
Mixed bor. and turn.	36.00 to 37.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Low phos. forge crops	55.00 to 57.00
Low phos. plate	52.00 to 55.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	62.00 to 63.00
Rerolling rails	65.50 to 66.50
Rails 2 ft and under	67.00 to 68.00
Locomotive tires, cut	58.00 to 59.00
Cut bolsters & side frames	54.00 to 55.00
Angles and splice bars	53.00 to 64.00
RR. steel car axles	100.00 to 105.00
RR. couplers and knuckles	58.00 to 59.00
No. 1 machinery cast	64.00 to 66.00
No. 1 agricul. cast	61.00 to 62.00
Heavy breakable cast	55.00 to 57.00
RR. grate bars	48.00 to 49.00
Cast iron brake shoes	52.00 to 53.00
Cast iron car wheels	58.00 to 59.00
Malleable	78.00 to 82.00

Philadelphia

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	41.00 to 42.00
Machine shop turn.	36.00 to 37.00
Mixed bor. and turn.	35.00 to 36.00
Shoveling turnings	38.00 to 39.00
Low phos. punchings, plate	50.00 to 51.00
Low phos. 5 ft and under	50.00 to 51.00
Low phos. bundles	48.00 to 49.00
Hvy. axle forge turn.	44.00 to 45.00
Clean cast chem. borings	42.00 to 43.00
RR. steel wheels	53.00 to 54.00
RR. spring steel	53.00 to 54.00
Rails 18 in. and under	66.00 to 67.00
No. 1 machinery cast	62.00 to 63.00
Mixed yard cast	53.00 to 54.00
Heavy breakable cast	53.00 to 54.00
Cast iron car wheels	67.00 to 68.00
Malleable	69.00 to 70.00

Cleveland

No. 1 hvy. melting	\$45.25 to \$46.00
No. 2 hvy. melting	43.25 to 44.00
No. 1 busheling	45.25 to 46.00
No. 1 bundles	45.25 to 46.00
No. 2 bundles	42.25 to 43.00
Machine shop turn.	37.25 to 38.00
Mixed bor. and turn.	39.25 to 40.00
Shoveling turnings	39.25 to 40.00
Cast iron borings	39.25 to 40.00
Low phos. 2 ft and under	47.75 to 48.50
Steel axle turn.	44.25 to 45.00
Drop forge flashings	45.25 to 46.00
No. 1 RR. hvy. melting	46.00 to 46.50
Rails 3 ft and under	70.00 to 71.00
Rails 18 in. and under	72.00 to 73.00
No. 1 machinery cast	69.00 to 70.00
RR. cast	71.00 to 72.00
RR. grate bars	50.00 to 51.00
Stove plate	55.00 to 56.00
Malleable	76.00 to 77.00

Youngstown

No. 1 hvy. melting	\$45.75 to \$46.50
No. 2 hvy. melting	43.75 to 44.50
No. 1 bundles	45.75 to 46.50

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$42.75 to \$43.00
Machine shop turn	37.75 to 38.50
Shoveling turnings	39.75 to 40.50
Cast iron borings	39.75 to 40.50
Low phos. plate	48.25 to 49.00

Buffalo

No. 1 hvy. melting	\$44.50 to \$45.25
No. 2 hvy. melting	42.50 to 43.25
No. 1 busheling	42.50 to 43.25
No. 1 bundles	43.50 to 44.25
No. 2 bundles	41.50 to 42.25
Machine shop turn.	36.50 to 37.25
Mixed bor. and turn.	36.50 to 37.25
Shoveling turnings	38.50 to 39.25
Cast iron borings	36.50 to 37.25
Low phos. plate	48.25 to 49.00
Scrap rails, random lgth.	55.00 to 56.00
Rails 2 ft and under	60.00 to 61.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast	59.00 to 60.00
No. 1 cupola cast	54.00 to 55.00
Small indus. malleable	60.00 to 61.00

Birmingham

No. 1 hvy. melting	\$42.50 to \$43.50
No. 2 hvy. melting	38.50 to 39.50
No. 2 bundles	37.50 to 38.50
No. 1 busheling	38.00 to 39.00
Machine shop turn.	31.00 to 32.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	27.00 to 28.00
Bar crops and plate	47.00 to 48.00
Structural and plate	46.00 to 47.00
No. 1 RR. hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	58.00 to 59.00
Rerolling rails	61.00 to 62.00
Rails 2 ft and under	66.00 to 67.00
Angles & splice bars	59.00 to 60.00
Std. steel axles	61.00 to 62.00
No. 1 cupola cast	59.00 to 60.00
Stove plate	54.00 to 55.00
Cast iron carwheels	46.00 to 47.00

St. Louis

No. 1 hvy. melting	\$45.00 to \$47.00
No. 2 hvy. melting	41.00 to 42.00
No. 2 bundled sheets	40.00 to 41.00
Machine shop turn.	28.50 to 29.50
Shoveling turnings	35.00 to 36.00
Rails, random lengths	58.00 to 59.00
Rails 3 ft and under	66.00 to 68.00
Locomotive tires, uncut	57.00 to 58.00
Angles and splice bars	66.00 to 68.00
Std. steel car axles	100.00 to 105.00
RR. spring steel	57.00 to 58.00
No. 1 machinery cast	65.00 to 66.00
Hvy. breakable cast	56.00 to 58.00
Cast iron brake shoes	55.00 to 57.00
Stove plate	53.00 to 55.00
Cast iron car wheels	63.00 to 65.00
Malleable	55.00 to 57.00

New York

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$39.00
No. 2 hvy. melting	37.00
No. 2 bundles	36.00
Machine shop turn.	31.00
Mixed bor. and turn.	31.00
Shoveling turnings	32.00
Clean cast chem. bor.	\$38.00 to 39.00
No. 1 machinery cast	52.00 to 53.00
Mixed yard cast	47.00 to 48.00
Charging box cast	47.00 to 48.00
Heavy breakable cast	46.00 to 47.00
Unstrp. motor blocks	42.00 to 43.00

Boston

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$35.67
No. 2 hvy. melting	33.67
No. 1 bundles	38.00

No. 2 bundles	\$32.67
Machine shop turn.	27.67
Mixed bor. and turn.	\$26.67 to 27.67
Shoveling turnings	29.67
No. 1 busheling	36.67
Clean cast chem. borings	33.00 to 34.00
No. 1 machinery cast	48.00 to 49.00
Mixed cupola cast	44.00 to 45.00
Heavy breakable cast	42.00 to 43.00
Stove plate	42.00 to 43.00

Detroit

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$40.25
No. 2 hvy. melting	38.25
No. 1 bundles, openhearth	40.25
No. 1 bundles, electric	42.75
New busheling	40.25
Flashings	40.25
Machine shop turn.	32.25
Mixed bor. and turn.	32.25
Shoveling turnings	34.25
Cast iron borings	34.25
Low phos. plate	42.75
No. 1 cupola cast	\$56.00 to 58.00
Heavy breakable cast	47.00 to 48.00
Stove plate	46.00 to 48.00
Automotive cast	60.00 to 62.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$44.25
No. 2 hvy. melting	42.25
No. 1 bundles	44.25
No. 2 bundles, black	42.25
No. 2 bundles, mixed	41.25
Machine shop turn.	33.00
Mixed bor. and turn.	34.00
Shoveling turnings	34.00
Cast iron borings	34.00
Low phos.-steel	46.75
Low phos. 18 in. under	62.00
Rails, random lengths	\$62.00 to 63.00
Rails, 18 in. and under	73.00 to 73.00
No. 1 cupola cast	65.00 to 66.00
Hvy. breakable cast	59.00 to 60.00
Drop broken cast	71.00 to 72.00

San Francisco

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	30.00
No. 2 bundles	28.00
No. 3 bundles	25.00
Machine shop turn.	16.00
Elec. fur. 1 ft and under	\$40.00 to 42.50
No. 1 RR. hvy. melting	30.00
Scrap rails random lgth.	30.00
No. 1 cupola cast	48.00 to 46.00

Los Angeles

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	30.00
No. 2 bundles	28.00
No. 3 bundles	25.00
Mach. shop turn.	16.00
Elec. fur. 1 ft and under	\$42.00 to 45.00
No. 1 RR. hvy. melting	30.00
Scrap rails random lgth.	30.00
No. 1 cupola cast	52.00

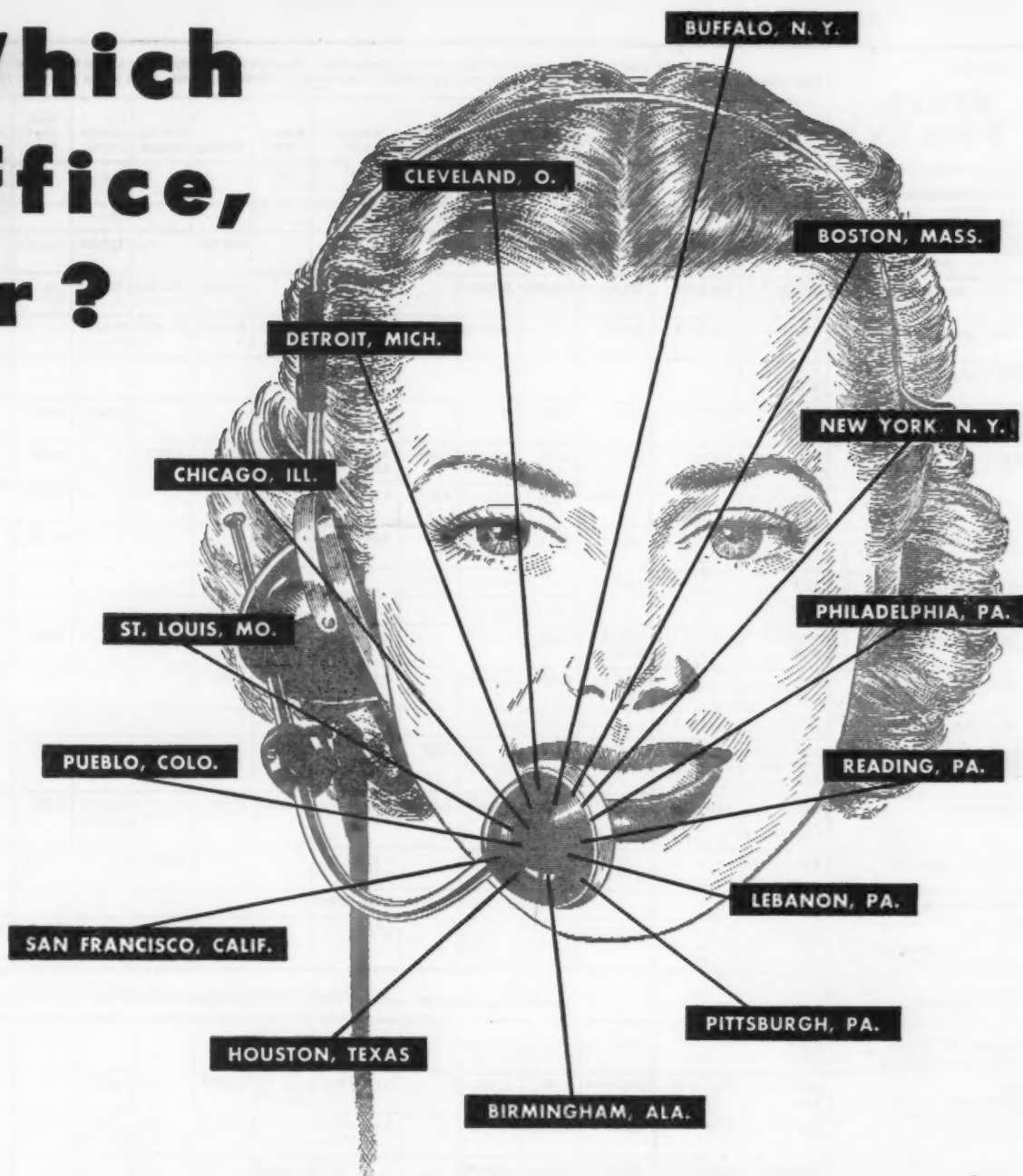
Seattle

No. 1 hvy. melting	\$28.00
No. 2 hvy. melting	26.00
No. 1 bundles	22.00
No. 2 bundles	23.00
No. 3 bundles	18.00
Elec. fur. 1 ft and under	\$40.00 to 45.00
RR. hvy. melting	29.00
No. 1 cupola cast	45.00

Hamilton, Ont.

No. 1 hvy. melting	\$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact. prep'd.	29.00
Bush., new fact. unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	45.00

Which office, sir?



Since 1889 Luria Brothers and Company, Inc. have pursued a policy of better service made possible by years of "know how" and personnel who have the desire to please.

The expansion of our organization, with offices located in 15 major cities, is in accordance with our policy to give better service to our customers.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP LURIA BROTHERS AND COMPANY, INC.

Main Office

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Pennsylvania

Yards

LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH.
MODENA, PA. • PITTSBURGH, PA.
ERIE, PA.



Branch Offices

BIRMINGHAM, ALA. Empire Bldg.	CHICAGO, ILL. 100 W. Monroe St.	HOUSTON, TEXAS 1114 Texas Av. Bldg.	PITTSBURGH, PA. Oliver Bldg.
BOSTON, MASS. Statler Bldg.	CLEVELAND, O. 1022 Midland Bldg.	LEBANON, PA. Luria Bldg.	PUEBLO, COLO. 334 Colorado Bldg.
BUFFALO, N.Y. Genesee Bldg.	DETROIT, MICH. 2011 Book Bldg.	NEW YORK, N.Y. Woolworth Bldg.	READING, PA. Luria Bldg.
ST. LOUIS, MO. 2110 Railway Exchange Bldg.		SAN FRANCISCO, CAL. Pacific Gas & Elec. Co. Bldg.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

December 28, 1950

IRON AGE STEEL PRICES	Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page. Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.													
	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	\$52.00 ¹													
Alloy, net ton	\$54.00 ^{1,17}													\$54.00 ¹
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	\$56.00 ^{1,5}	\$56.00 ¹	\$56.00 ¹						\$56.00 ³		\$56.00 ³			
Carbon forging billets, net ton	\$66.00 ^{1,5}	\$66.00 ^{1,4}	\$66.00 ¹	\$66.00 ⁴	\$66.00 ⁴				\$66.00 ^{3,4}	\$73.00 ^{2,6}	\$66.00 ³			\$69.00 ¹
Alloy, net ton	\$70.00 ^{1,17}	\$70.00 ^{1,4}	\$70.00 ¹		\$70.00 ⁴			\$70.00 ³	\$70.00 ^{3,4}	\$77.00 ^{2,6}	\$70.00 ³			\$73.00 ¹
PIPE SKELP	3.35 ¹ 3.45 ³						3.35 ^{1,4}							
WIRE RODS	4.10 ² 4.30 ^{1,6}	4.10 ^{2,4,3,3}	4.10 ⁶	4.10 ³			4.10 ⁶				4.10 ³	4.20 ³		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60 ^{1,5,9,15} 3.75 ^{2,6}	3.60 ^{2,23}	3.60 ^{1,6,8}	3.60 ⁴		3.60 ⁷	3.60 ^{1,4,6} 4.00 ^{1,3}		3.60 ³	4.00 ^{2,6}		3.60 ³		3.80 ^{1,2} 4.40 ^{4,7}
Cold-rolled	4.35 ^{1,5,9,12} 5.35 ^{3,5}		4.35 ^{1,6,8}	4.35 ⁴		4.35 ⁷	4.35 ^{4,6}		4.35 ³			4.35 ³		4.55 ^{1,2}
Galvanized (10 gage)	4.80 ^{1,9,15}		4.80 ^{1,8}		4.80 ⁴	4.80 ⁷	6.00 ⁴					4.80 ³		
Enameling (12 gage)	4.65 ¹		4.65 ^{1,8}			4.65 ⁷								
Long ternes (10 gage)	5.20 ^{9,15}						6.00 ⁴							
Hi str. low alloy, h.r.	5.40 ^{1,8} 5.75 ³	5.40 ¹	5.40 ^{1,8} 5.90 ⁶	5.40 ⁴			5.40 ^{1,4,13}		5.40 ³	5.65 ^{2,6}		5.40 ³		
Hi str. low alloy, c.r.	6.55 ^{1,5} 6.90 ⁶		6.55 ^{1,8} 7.05 ⁶	6.55 ⁴			6.55 ⁴		6.55 ³			6.55 ³		
Hi str. low alloy, galv.	7.20 ¹													
STRIP Hot-rolled	3.60 ^{9,4,00^{1,1}} 3.75 ^{2,6} 3.50 ³	3.50 ^{6,6}	3.50 ^{1,6,8}			3.50 ⁷	3.50 ^{1,4,6} 4.00 ^{1,3}		3.50 ^{3,4}	3.90 ^{2,6}		3.50 ³		4.40 ^{4,7}
Cold-rolled	4.65 ^{1,9} 5.00 ^{2,6} 5.35 ^{3,4,6,8}	4.90 ^{6,6,6}	4.90 ⁶	4.65 ³		4.65 ⁷	4.65 ^{4,6} 5.35 ^{1,3}		4.65 ³			4.65 ³		5.45 ^{4,7} 5.80 ^{6,8} 5.80 ^{8,1}
Hi str. low alloy, h.r.	5.75 ³		5.50 ¹ 5.30 ^{6,8,0}				4.95 ⁴ , 5.50 ¹ 5.40 ^{1,3}			5.55 ^{2,6}				
Hi str. low alloy, c.r.	7.20 ⁹			6.70 ⁵			6.20 ⁴ , 6.55 ^{1,3}							
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	\$7.50 ^{1,5,9,15}		\$7.50 ^{1,6,8}				\$7.50 ⁴					7.80 ³	\$7.70 ^{2,2}	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct \$1.15, 90¢ and 85¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.85 ¹ 6.15 ^{1,5}		5.85 ¹				5.30 ⁴							
BARS Carbon steel	3.70 ^{1,8} 3.85 ⁹	3.70 ^{1,4,3,3}	3.70 ^{1,4,6,8}	3.70 ⁴	3.70 ⁴		3.70 ^{1,4,6}		3.70 ^{3,4}		3.70 ³			3.85 ^{1,1} 4.70 ^{6,4}
Reinforcing†	3.70 ^{1,8}	3.70 ⁴	3.70 ^{1,6,8}	3.70 ⁴			3.70 ^{1,4}		3.70 ^{3,4}		3.70 ³	3.70 ³		
Cold-finished	4.55 ^{2,4,5,8,2,7,1}	4.55 ^{2,6,9,7,6,2,7,3}	4.55 ^{7,4,7,3}	4.55 ²	4.55 ^{4,8,3}									
Alloy, hot-rolled	4.30 ^{1,17}	4.30 ^{1,4,2,3}	4.30 ^{1,6,8}		4.30 ⁴		4.30 ^{1,6}	4.30 ³	4.30 ^{3,4}		4.30 ³			4.45 ¹
Alloy, cold-drawn	5.40 ^{1,7,5,3,6,9,7,1}	5.40 ^{4,3,3,6,9,7,3}	5.40 ⁴ 5.90 ^{7,4}		5.40 ^{4,8,3}			5.40 ³	5.40 ³					5.55 ^{6,4}
Hi str. low alloy, h.r.	5.55 ^{1,5}		5.55 ^{1,8} 6.05 ⁶	5.55 ⁴			5.55 ¹	5.55 ³	5.55 ³		5.55 ³			
PLATE Carbon steel	3.70 ^{1,5,15}	3.70 ¹	3.70 ^{1,6,8}	3.70 ⁴ 4.00 ⁹			3.70 ^{1,4} 3.95 ^{1,3}		3.70 ³	4.15 ^{2,6}	3.70 ³	3.70 ³		
Floor plates			4.75 ⁸	4.75 ⁵						4.75 ^{2,6}				
Alloy	4.75 ¹	4.75 ¹	4.75 ¹				5.20 ^{1,3}			5.05 ^{2,6}	4.75 ³	4.75 ³		
Hi str. low alloy	5.65 ^{1,8}	5.65 ¹	5.65 ^{1,8}	5.65 ^{4,6}			5.65 ⁴ 5.70 ^{1,3}			5.90 ^{2,6}	5.65 ³	5.65 ³		
SHAPES, Structural	3.65 ^{1,8} 3.90 ⁹	3.65 ^{1,2,3}	3.65 ^{1,8}					3.70 ³	3.70 ³		3.70 ³			
Hi str. low alloy	5.50 ^{1,8}	5.50 ¹	5.50 ^{1,8}					5.50 ³	5.50 ³		5.50 ³			
MANUFACTURERS' WIRE Bright	4.85 ^{2,8} 5.10 ^{1,6}	4.85 ² 4.33		4.85 ²				Kokomo=5.80 ^{2,6}			4.85 ³	4.95 ³	Duluth=4.85 ³	
PILING, Steel Sheet	4.45 ¹	4.45 ¹	4.45 ⁸						4.45 ³					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

KEY TO STEEL PRODUCERS

With Principal Offices

- 1 Carnegie-Illinois Steel Corp., Pittsburgh
- 2 American Steel & Wire Co., Cleveland
- 3 Bethlehem Steel Co., Bethlehem
- 4 Republic Steel Corp., Cleveland
- 5 Jones & Laughlin Steel Corp., Pittsburgh
- 6 Youngstown Sheet & Tube Co., Youngstown
- 7 Armco Steel Corp., Middletown, Ohio
- 8 Inland Steel Co., Chicago
- 9 Weirton Steel Co., Weirton, W. Va.
- 10 National Tube Co., Pittsburgh
- 11 Tennessee Coal, Iron & R. R. Co., Birmingham
- 12 Great Lakes Steel Corp., Detroit
- 13 Sharon Steel Corp., Sharon, Pa.
- 14 Colorado Fuel & Iron Corp., Denver
- 15 Wheeling Steel Corp., Wheeling, W. Va.
- 16 Geneva Steel Co., Salt Lake City
- 17 Crucible Steel Co. of America, New York
- 18 Pittsburgh Steel Co., Pittsburgh
- 19 Kaiser Steel Corp., Oakland, Calif.
- 20 Portsmouth Div., Detroit Steel Corp., Detroit
- 21 Lukens Steel Co., Coatesville, Pa.
- 22 Granite City Steel Co., Granite City, Ill.
- 23 Wisconsin Steel Co., South Chicago, Ill.
- 24 Columbia Steel Co., San Francisco
- 25 Copperweld Steel Co., Glassport, Pa.
- 26 Alan Wood Steel Co., Conshohocken, Pa.
- 27 Calif. Cold Rolled Steel Corp., Los Angeles
- 28 Allegheny Ludlum Steel Corp., Pittsburgh
- 29 Worthington Steel Co., Claymont, Del.
- 30 Continental Steel Corp., Kokomo, Ind.
- 31 Rotary Electric Steel Co., Detroit
- 32 Laclede Steel Co., St. Louis
- 33 Northwestern Steel & Wire Co., Sterling, Ill.
- 34 Keystone Steel & Wire Co., Peoria, Ill.
- 35 Central Steel & Wire Co., Harrisburg, Pa.
- 36 Carpenter Steel Co., Reading, Pa.
- 37 Eastern Stainless Steel Corp., Baltimore
- 38 Washington Steel Corp., Washington, Pa.
- 39 Jessop Steel Co., Washington, Pa.
- 40 Blair Strip Steel Co., New Castle, Pa.
- 41 Superior Steel Corp., Carnegie, Pa.
- 42 Timken Steel & Tube Div., Canton, Ohio
- 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- 44 Reeves Steel & Mfg. Co., Dover, Ohio
- 45 John A. Roebling's Sons Co., Trenton, N. J.
- 46 Simonds Saw & Steel Co., Fitchburg, Mass.
- 47 McLouth Steel Corp., Detroit
- 48 Cold Metal Products Co., Youngstown
- 49 Thomas Steel Co., Warren, Ohio
- 50 Wilson Steel & Wire Co., Chicago
- 51 Sweet's Steel Co., Williamsport, Pa.
- 52 Superior Drawn Steel Co., Monaca, Pa.
- 53 Tremont Nail Co., Wareham, Mass.
- 54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
- 55 Ingersoll Steel Div., Chicago
- 56 Phoenix Iron & Steel Co., Phoenixville, Pa.
- 57 Fitzsimmons Steel Co., Youngstown
- 58 Stanley Works, New Britain, Conn.
- 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- 60 American Cladmetals Co., Carnegie, Pa.
- 61 Cuyahoga Steel & Wire Co., Cleveland
- 62 Bethlehem Pacific Coast Steel Corp., San Francisco
- 63 Follansbee Steel Corp., Pittsburgh
- 64 Niles Rolling Mill Co., Niles, Ohio
- 65 Atlantic Steel Co., Atlanta
- 66 Acme Steel Co., Chicago
- 67 Jaslyn Mfg. & Supply Co., Chicago
- 68 Detroit Steel Corp., Detroit
- 69 Wyckoff Steel Co., Pittsburgh
- 70 Bliss & Laughlin, Inc., Harvey, Ill.
- 71 Columbia Steel & Shaffing Co., Pittsburgh
- 72 Cumberland Steel Co., Cumberland, Md.
- 73 La Salle Steel Co., Chicago
- 74 Monarch Steel Co., Inc., Hammond, Ind.
- 75 Empire Steel Co., Mansfield, Ohio
- 76 Mahoning Valley Steel Co., Niles, Ohio
- 77 Oliver Iron & Steel Co., Pittsburgh
- 78 Pittsburgh Screw & Bolt Co., Pittsburgh
- 79 Standard Forging Corp., Chicago
- 80 Driver Harris Co., Harrison, N. J.
- 81 Detroit Tube & Steel Div., Detroit
- 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- 83 Sheffield Steel Corp., Kansas City
- 84 Plymouth Steel Co., Detroit
- 85 Wickwire Spencer Steel, Buffalo
- 86 Angell Nail and Chaplet, Cleveland
- 87 Mid-States Steel & Wire, Crawfordsville, Ind.
- 88 National Supply, Pittsburgh, Pa.
- 89 Wheatland Tube Co., Wheatland, Pa.
- 90 Mercer Tube & Mfg. Co., Sharon, Pa.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana	
			F=\$79.00 ¹⁰	INGOTS carbon forging, net ton
	\$82.00 ⁸³		F=\$80.00 ¹⁰	Alloy, net ton
		\$56.00 ¹¹	F=\$75.00 ¹⁰	BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	\$74.00 ⁸³	\$86.00 ¹¹	F=\$85.00 ¹⁰ SF, LA, S=\$85.00 ⁸³	Carbon forging billets, net ton
	\$78.00 ⁸³		F=\$89.00 ¹⁰⁴ LA=\$90.00 ⁸³	Alloy net ton
				PIPE SKELP
	4.50 ⁸³	4.10 ^{4,11}	SF=4.90 ² LA=4.90 ^{84,63}	WIRE RODS
		3.60 ^{4,11}	SF, LA=4.30 ²⁴ F=4.55 ¹⁰	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35 ¹¹	SF=5.30 ²⁴ F=5.30 ¹⁰	Cold-rolled
		4.80 ^{4,11}	SF, LA=5.55 ²⁴	Galvanized (10 gage)
			Ashland=4.80 ⁷	Enameling (12 gage)
		5.40 ¹¹	F=6.35 ¹⁰	Long ternes (10 gage)
			F=7.50 ¹⁰	Hi str. low alloy, h.r.
				Hi str. low alloy, c.r.
				Hi str. low alloy, galv.
4.10 ⁸³	4.90 ⁸³	3.50 ⁴	SF, LA=4.25 ^{24,63} F=4.75 ¹⁰ , S=4.50 ⁸³	STRIP Hot-rolled
			Atlanta=4.05 ⁸⁶ Minnequa=4.55 ¹⁴	Cold-rolled
			F=6.30 ¹⁰ LA=6.40 ²⁷	Hi str. low alloy, h.r.
		5.30 ¹¹	F=6.70 ¹⁰	Hi str. low alloy, c.r.
		7.60 ¹¹	SF=8.25 ²⁴	TINPLATE Cokes, 1.50-lb base box 1.25 lb. deduct 20¢
Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price				Electrolytic 0.25, 0.50, 0.75 lb box
				BLACKPLATE, 29 gage Hollowware enameling
4.30 ⁸³	4.10 ⁸³	3.70 ^{4,11}	SF, LA=4.40 ²⁴	BARS Carbon steel
4.30 ⁸³	4.10 ⁸³	3.70 ^{4,11}	SF, S=4.45 ⁸³ F=4.40 ¹⁰ LA=4.40 ⁸³	Reinforcing†
			Atlanta=4.25 ⁸⁶ Minnequa=4.50 ¹⁴	Cold-finished
4.80 ⁸³	4.70 ⁸³		Newark=5.00 ⁸⁹ Putnam=5.10 ⁸⁹ Hartford=5.10 ⁴ Los Angeles=6.00 ⁴	Alloy, hot-rolled
			LA=5.35 ⁸³ F=5.35 ¹⁰	Alloy, cold-drawn
			Newark=5.70 ⁸⁹ Worcester=5.85 ⁴ Hartford=5.85 ⁴	Hi str. low alloy, h.r.
		5.55 ¹¹	F=6.50 ¹⁰	PLATE Carbon steel
	4.10 ⁸³	3.70 ^{4,11}	F=4.30 ¹⁰ S=4.50 ⁸³ Geneva=3.70 ¹⁰	Floor plates
			Claymont=4.15 ²⁰ Coatesville=4.15 ²¹ Minnequa=4.50 ¹⁴	Alloy
			Harriburg=5.25 ⁸⁵ Coatesville=5.25 ²¹	Hi str. low alloy
			F=5.70 ¹⁰ Geneva=5.55 ¹⁰	SHAPES, Structural
4.25 ⁸³	4.05 ⁸³	3.65 ^{4,11}	SF=4.20 ⁸³ F=4.25 ¹⁰ LA=4.25 ^{24,63} S=4.30 ⁸³	Hi str. low-alloy
		50 ¹¹	F=6.10 ¹⁰	MANUFACTURERS' WIRE Bright
5.45 ⁸³	5.25 ⁸³	4.85 ^{4,11}	SF, LA=5.80 ²⁴	
			Atlanta=5.10 ⁸³ Worcester=5.15 ² Minnequa=5.10 ¹⁴	

STAINLESS STEELS

Base prices, in cents per pound,
f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingot, re-rolling	14.25	15.00	16.50	16.00	24.25	19.75	21.50	12.75	14.75	13.00
Slabs, billets re-rolling	18.50	19.75	21.75	20.75	31.75	26.00	28.25	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.00	36.50	35.50	52.50	40.00	44.50	26.00	28.50	26.50
Billets, forging	26.25	26.25	28.25	27.50	41.00	31.00	34.75	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.25	33.75	32.75	48.75	36.75	41.25	25.75	26.25	26.25
Plates	33.00	33.00	35.00	35.00	51.50	40.50	45.00	27.00	27.50	27.50
Sheets	41.00	41.00	43.00	43.00	56.50	49.00	53.50	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.00	32.25	30.00	48.25	36.75	41.00	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.50	40.00	38.50	55.50	48.00	52.00	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets*: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 5¢); 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28 (type 416 add 1/4¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15 1/2 ga.	Fence Posts	Single Loop Barb Wire	Twisted Barb Wire	Gal. Barbed Wire	Merch. Wire Ann'd.	Merch. Gal.
Alabama City-4	118	126	123	136	140	143	5.70	5.95
Alliuppa, Pa.-5	118	132	126	136	140	143	5.70	6.15
Atlanta-65	113	133	126	126	143	143	5.95	6.40
Bartonville-34	118	130	140	123	143	143	5.95	6.15
Buffalo-95	118	126	121	123	136			
Chicago-4	118	126	121	123	136			
Cleveland-86							5.70	5.85
Cleveland-2								
Crawfordsville-87	130							
Donora, Pa.-2	118	130	123	140	140	143	5.70	5.85
Duluth-2	118	130	123	140	140	143	5.70	5.85
Fairfield, Ala.-11	118	126	123	136	140	143	5.70	5.95
Houston-93	126	138			148	148	6.10	6.55
Johnstown, Pa.-3	118	130			140	140	5.70	6.15
Joliet, Ill.-2	118	130	123	140	140	143	5.70	5.85
Kokomo, Ind.-30	120	126	126	138	138	138	5.80	6.05
Los Angeles-62								
Kansas City-83	130	130	142	136	152	152	6.30	6.75
Minneapolis-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135			145	145	5.95	6.40
Moline, Ill.-4			121					
Palmer-85								
Pittsburg								
Cal.-24	137	149		147	156		6.65	6.80
Portsmouth-20	124	137		147	147		6.10	6.60
Rankin, Pa.-2	118	130			140	140	5.70	5.85
San Francisco-14	118	126	116	123	136		5.70	5.95
So. Chicago, Ill.-4								
So. San								
Franklin-14				147			6.65	7.10
Sparrows Pt.-3	120			125	142	132	5.80	6.25
Sterling, Ill.-35	118	130	140	123	140	140		
Struthers, Ohio-6							6.65	
Torrance, Cal.-24	138							
Worcester-2	124						6.00	6.15
Williamsport, Pa.-51								

Cut Nails, carloads, base, \$8.75 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa., (26), Wareham, Mass., (53) Wheeling, W. Va., (15).

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer-1	3.60	4.00	4.70					
Chicago-4				6.15				
Enaley-11	3.60	4.00						
Fairfield-11		4.00	4.40			6.60	4.50	
Gary-1	3.60	4.00					4.50	
Ind. Harbor-8	3.60		4.70	6.15	5.25	6.60	4.50	
Johnstown-3		4.00			5.60	6.60		
Joliet-1		4.00	4.70					
Kansas City-83				6.40				
Lackawanna-3	3.60	4.00	4.70			6.60	4.50	
Lebanon-3				6.15				9.00
Minneapolis-14	3.60	4.50	4.70	6.15		6.60	4.50	9.00
Pittsburgh-77						9.35		9.00
Pittsburgh-78								9.00
Pittsburgh-5				6.15				
Pittsburgh-24							4.65	
Seattle-62				6.10			4.35	
Struthers-6	3.60		4.70				4.50	
Torrance-24				5.60				
Youngstown-4				6.15				

Track Bolts, heat treated, to railroads, 9.85¢ per lb.

BOILER TUBES

Seamless steel, electric welded commercial boiler tubes, locomotive tubes, minimum wall, per 100 ft at mill, c.i. lots, cut lengths 10 to 24 ft.

OD gage in in. BWG	Seamless H.R. C.D.	Electric H.R. C.D.	Weld H.R. C.D.	
2 13	\$22.67	\$26.66	\$21.99	\$25.86
2 1/2 12	30.48	35.84	29.57	34.76
3 12	33.90	39.90	32.89	34.80
3 1/2 11	42.37	49.89	41.10	48.39
4 10	52.60	61.88	51.03	60.02

Pittsburgh Steel add, H-R: 2 in., 62¢; 2 1/2 in., 84¢; 3 in., 92¢; 3 1/2 in., \$1.17; 4 in., \$1.45. Add, C-R: 2 in., 74¢; 2 1/2 in., 99¢; 3 in., \$1.10; 3 1/2 in., \$1.37; 4 in., \$1.70.

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosclaire, Ill. Base price, per ton net: Effective CaF₂ content: 70% or more \$41.00 60% or less 38.00

CAST IRON WATER PIPE

Per net ton
6 to 24-in., del'd Chicago \$105.30 to \$108.80
6 to 24-in., del'd N. Y. 104.50 to 105.50
6 to 24-in., Birmingham 91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less \$108.50 to \$113.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about \$200 per net in.

BUTTWELD										SEAMLESS									
1/2 in.	3/4 in.	1 in.	1 1/4 in.	1 1/2 in.	2 in.	2 1/2 in.	3 in.	3 1/2 in.	4 in.	1/2 in.	3/4 in.	1 in.	1 1/4 in.	1 1/2 in.	2 in.	2 1/2 in.	3 in.	3 1/2 in.	4 in.
Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.	Bk. Gal.
34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0						
36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
25.0	3.0	28.0	7.0	30.5	10.5	31.0	21.0	31.5	22.0	32.0	12.5	32.5	13.0						
36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	20.5	6.0	32.5	11.5	34.5	13.5
36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	20.5	6.5	32.5	12.0	34.5	14.5
35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0						
36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0						
36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	20.5	32.5		34.5		
36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	20.5	32.5		34.5		
36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	20.5	6.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																			
33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0						
35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
24.5	4.0	28.5	18.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0						
35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	20.5	7.5	32.5	12.0	34.5	15.5
35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	20.5	10.0	32.5	14.0	36.5	17.5
34.5	14.0	38.5	18.0	40.5	21.5	41.0	22.0	41.5	22.0	42.0	22.5	42.5	23.0						
35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0						
35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	20.5	33.0		36.5		
35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	20.5	33.0		36.5		
35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	20.5	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc at 17¢ per lb. East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.5¢ to 17.50¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only, butt-weld and seamless, 1 pt. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 3/2 pt. higher discount. Butt-weld jobbers' discount, 5 pt.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢; Memphis, add 10¢; New York, add 30¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.60	6.84	7.48 ² 8.07	6.04	....	5.80	6.14	6.04	6.84- 6.83	10.24	10.54	11.83	12.19
Birmingham*	5.60	6.40	6.75	5.55	....	5.95	5.70	5.55	....	....	....	....	....
Boston	6.20	7.00	7.74- 8.29	6.15	8.50 ¹⁶	6.48- 6.78	6.20	6.05	6.79- 6.84	10.25	10.55	11.90- 12.00	12.20- 12.30
Buffalo	5.60	6.40	7.74 8.09	5.86	....	6.05	5.80	5.60	6.40 6.45	10.15	10.45	11.80	11.95- 12.10
Chicago	5.60	6.40	7.75	5.55	....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.80	....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	8.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	....	5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06
Houston	7.00	8.25	....	....	....	6.85	6.50	6.65	9.35	10.35	11.25	....	12.75
Indianapolis	....	....	....	....	....	....	....	....	....	....	....	....	....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	8.70 ¹⁶	6.40	6.35	6.35	7.55	11.30	11.30	13.20	13.50
Memphis*	6.33	7.08	....	6.38	....	6.43	6.33	6.08	7.16	....	....	....	....
Milwaukee	5.74	6.54	7.89	5.89- 6.59	....	5.94	6.84	5.89	6.44- 6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.95	....	5.75	7.25	5.95	5.75	5.75	7.30	....	....	....	....
New York*	5.57- 5.97 8.50 ¹³	7.19 ²² 7.24 ¹	8.14 ³	6.29- 6.69	8.63 ¹⁶	6.29- 6.59 6.50 ¹³	6.10	6.12	6.99	10.05- 10.15	10.35- 10.45	11.70- 11.80	12.10- 12.20
Norfolk	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	6.90	6.80	8.00	6.10	....	6.05	5.90	6.05	6.86	10.15	10.45	....	....
Pittsburgh	5.80	6.40	7.75	5.65- 5.95	....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60	....	8.50	7.30	....	6.80	6.95	6.90	....	....	....	....	....
Salt Lake City	7.95	....	9.70	8.70	....	8.05	8.30	8.65	9.00	....	....	....	....
San Francisco*	6.65	8.05 ²	8.55- 8.90 ²	6.60	....	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20- 13.50
Seattle	7.05	8.60	9.20	9.05	....	6.75	6.65	6.75	9.05	....	....	....	....
St. Louis	5.80- 5.85	6.65	8.00	5.80	8.00 ¹⁶ - 8.28	6.13	6.03	5.80	6.55- 6.85	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	....	6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed on prices.)

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets; 2000 to 9999 lb. Cold-finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. Cold-rolled strip; 2000 to 9999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles; (22) 1500 to 9999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low. Phos.
Bethlehem	54.00	54.00	55.00	55.00	.....	Boston	Everett	\$6.00-8.00	.....	52.05- 53.05	53.55- 53.75	.....	.....
Birmingham	48.25	48.25	.....	.....	.....	Boston	Seaboard	6.00	.....	58.70	59.29	59.29	60.90
Buffalo	52.00	52.00	53.00	53.00	.....	Bethlehem	Bethlehem	4.25	.....	55.50	56.50	56.50	.....
Chicago	52.00	52.00	53.00	53.00	.....	Cincinnati	Birmingham	6.70	56.60	55.50	56.50	56.50	.....
Cleveland	52.00	52.00	53.00	53.00	57.00	Cincinnati	Bethlehem	2.03	.....	57.13	57.63	58.13	.....
Dallas-Wheat, Tex.	40.00	40.00	45.00	.....	.....	Los Angeles	Genova-Ironton	7.70	50.70	50.20	.....	.....	.....
Detroit	52.00	52.00	53.00	53.00	.....	Los Angeles	Genova-Ironton	.....	50.70	50.20	.....	.....	.....
Erie	52.00	52.00	53.00	53.00	.....	Marietta	Cleveland, Toledo	3.33	56.33	55.83	56.33	56.33	60.33
Everett	52.00	52.00	53.00	53.00	.....	Philadelphia	Bethlehem	2.30	56.30	56.89	57.39	57.89	.....
Fontana	52.00	52.00	53.00	53.00	.....	Philadelphia	Switzerland	1.44	57.44	57.94	58.44	58.94	.....
Granite City	52.00	52.00	53.00	53.00	.....	Philadelphia	Seaboard	3.00	57.00	57.59	58.09	58.59	63.09
Hobart	52.00	52.00	53.00	53.00	.....	Rochester	Buffalo	2.03	54.03	55.13	55.63	.....	.....
Ironton, Utah	52.00	52.00	53.00	53.00	.....	San Francisco	Genova-Ironton	7.70	50.70	50.20	.....	.....	.....
Pittsburgh	52.00*	52.00	53.00	53.00	.....	San Francisco	Fontana	.....	50.70	50.20	.....	.....	.....
Seaboard	52.00	52.00	53.00	53.00	.....	Seattle	Genova-Ironton	7.70	50.70	50.20	.....	.....	.....
Seaboard	52.00	52.00	53.00	53.00	.....	Seattle	Fontana	.....	50.70	50.20	.....	.....	.....
Switzerland	52.00	52.00	53.00	53.00	.....	St. Louis	Granite City	0.75 Arb.	51.05	52.15	52.65	.....	.....
Toledo	52.00	52.00	53.00	53.00	.....	Syracuse	Buffalo	3.00	56.00	56.00	56.50	.....	.....
Troy, N. Y.	54.00	54.00	55.00	55.00	.....							
Youngstown	52.00	52.00	53.00	53.00	.....							

* Monesson, \$54.00.

Producing points prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 30¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢

per ton for each 0.50 pct manganese content in excess of 1.00 pct, 50¢ per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 0.01 to 0.50 pct C/L per g.t., f.o.b. Jackson, Ohio—\$62.50; f.o.b. Buffalo, \$62.75. Add \$1.50 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$62.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$70.50. High phosphorus charcoal pig iron is not being produced.

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices
(Base discount, f.o.b. mill, Pittsburgh,
Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pot Off List	Less Case	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2	
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2	
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2	
All diam. longer than 6 in.	14	27 1/2	
Lag, all diam. x 6 in. & shorter	23	35	
Lag, all diam. longer than 6 in.	21	33	
Flow bolts	34		

Nuts, Hot Pressed, Cold Punched—Sq

	Pot Off List	Less Keg (Reg.)	Less Keg K. (Hvy.)
1/2 in. & smaller	15	28 1/2	15
9/16 in. & 5/8 in.	12	25	6 1/2
3/4 in. to 1 1/2 in.			
Inclusive	9	23	1
1 1/2 in. & larger	7 1/2	22	1

Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	12	25	2	17 1/2
1 1/2 in. & larger	8 1/2	23	2	17 1/2

Nuts, Cold Punched—Hexagon

1/2 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
3/4 in. to 1 1/2 in.				
Inclusive	19 1/2	31 1/2	12	25
1 1/2 in. & larger	12	25	6 1/2	21

Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
1/2 in. & smaller	35	45
9/16 in. & 5/8 in.	29 1/2	40 1/2
3/4 in. to 1 1/2 in.		
Inclusive	24	36
1 1/2 in. & larger	13	26

7/16 in. & smaller

er	35	45
1/2 in. thru 5/8 in.	28 1/2	39 1/2
3/4 in. to 1 1/2 in.		
Inclusive	26	37

Stove Bolts

	Pot Off List
Packaged, steel, plain finished	56—10
Packaged, plated finish	41—10
Bulk, plain finish**	67*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

	Base per 100 lb
1/2 in. & larger	\$7.85
7/16 in. & smaller	36
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	

Cap and Set Screws

	Pot Off List
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 3/4 in. x 6 in., SAE 1020, bright	54
1/4 in. thru 1 in. up to & including 6 in.	48
1/4 in. thru 1 in. x 6 in. & shorter high C double heat treat	46
1/4 in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	\$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	7.70

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, undozed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.95¢
4, 5	40	20.48¢
3	40	21.53¢
2 1/2	34, 30	22.05¢
2	34, 30	24.15¢
CARBON		
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill
Stainless-carbon Plate Sheet

No. 304, 20 pct. Coatesville, Pa. (21)	\$29.5
Washgtn, Pa. (39)	\$29.5
Claymont, Del. (29)	\$28.00
Conshohocken, Pa. (26)	\$24.00
New Castle, Ind. (55)	\$25.50
Nickel-carbon	
10 pct. Coatesville (21)	32.5
Inconel-carbon	
10 pct. Coatesville (21)	40.5
Monel-carbon	
10 pct. Coatesville (21)	33.5
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)	77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)	7.75

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill					Base
W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.10
18	4	1	—	5	\$1.72
18	4	2	—	—	\$1.245
1.5	4	1.5	8	—	78.5¢
6	4	2	6	—	84¢
High-carbon chromium					63.5¢
Oil hardened manganese					35¢
Special carbon					32.5¢
Extra carbon					27¢
Regular carbon					23¢
Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.					

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	\$6.75
Electrical	\$7.25
Motor	\$8.50
Dynamo	9.30
Transformer 72	9.85
Transformer 65	10.40
Transformer 58	11.10
Transformer 52	11.90
PRODUCING POINTS—Beech Bottom, W. Va., 15; Brackenridge, Pa., 23; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 70¢; Indiana Harbor, Ind., 3; Mansfield, Ohio, 75; Niles, Ohio, 64, add 30¢; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.	

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$17.00 to \$17.50
Foundry, oven coke	
Buffalo, del'd	\$25.35
Chicago, f.o.b.	21.00
Detroit, f.o.b.	23.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Plainsville, Ohio, f.o.b.	24.00
Erle, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	21.00
St. Louis, f.o.b.	24.90
Birmingham, del'd	20.79

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	5.35¢
0.41 to 0.60 carbon	6.80¢
0.61 to 0.80 carbon	7.40¢
0.81 to 1.05 carbon	9.35¢
1.06 to 1.35 carbon	11.65¢
Worcester, add 0.30¢; Sharon, Carnegie, New Castle, add 0.35¢; Detroit, 0.26 to 0.40 carb., add 25¢; other grades add 15¢.	
New Haven, 0.26 to 0.40 carb., add 50¢; other grades add 5¢.	

REFRACTORIES

	(F.o.b. works)
Fire Clay Brick	Carloads, Per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	8.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$94.60
Childs, Pa.	90.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.75

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Chester	\$77.00

Magnesite Brick

Standard, Baltimore	\$99.00
Chemically bonded, Baltimore	88.00

Grain Magnesite

	St. %-in. grains
Domestic, f.o.b. Baltimore, in bulk fines removed	\$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	\$13.00
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METAL POWDERS

	Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.
Swedish sponge iron c.i.f.	7.4¢ to 9.0¢
New York, ocean bags	
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+%	
Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+%	36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+%	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.3+%	70.0¢ to \$1.35
Aluminum	29.00¢
Brass, 10 ton lots	30.00¢ to 32.25¢
Copper, electrolytic 10.25¢ plus metal value	
Copper, reduced	10.00¢ plus metal value
Cadmium 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quantity	\$2.50
Lead	6.5¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	32.6¢
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	34.15¢
Zinc, 10 ton lots	30.50¢ to 33.85¢

Ferrocchrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.05% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si			22.55

High-Nitrogen Ferrocchrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrocchrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrocchrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	22.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	\$1.09
0.50% max. C	1.05
00 min. C	1.04

Low Carbon Ferrocchrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)

Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, \$1.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, \$1.90¢ per lb contained Cr plus 12.20¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe	
Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si	
Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 33-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.35
Less ton lots	18.50

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va.	
Welland, Ont., Ashtabula, O.	\$185
F.o.b. Johnstown, Pa.	\$187
F.o.b. Sheridan, Pa.	\$185
F.o.b. Etna, Clairton, Pa.	\$175

\$2.00 for each 1% above 82% Mn. penalty, \$2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 96% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegelisen

Contract prices gross ton, lump, f.o.b.

16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa.	\$74.00
Pgh. or Chicago	75.00
	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe	
Carload, packed	29.75
Ton lots	31.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	33

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd., Mn. 85-90%.

Carloads		Ton	Less
0.07% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C			
7.00% max. Si	31.25	33.10	34.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C. deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	11.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$39.50 gross ton, freight allowed to normal trade area.

Si 15.01 to 15.60 pct, f.o.b. Niagara Falls, N. Y., \$33.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	19.00	75% Si	14.90
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

Other Ferroalloys

Alkifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	8.15¢
Ton lots	9.55¢

Calcium molybdate, 45-49%, f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.15
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Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.

Ton lots	\$4.90
Less ton lots	4.95

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta.

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	\$1.33
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Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton

10 tons to less carload	\$65.00
	75.00

Ferrotitanium, 40%, regular grade, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	\$1.38
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Ferrotitanium, 25%, low carbon, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	\$1.55

Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

	\$177.00
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Ferrotungsten, standard, lump or ½ x down, packed, per pound contained W, 5 ton lots; delivered

	\$3.25
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Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.

Openhearth	\$3.00-\$3.05
Crucible	3.10-3.15
High speed steel (Primors)	3.25

Molybdo oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.

	\$1.14
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bags, f.o.b. Washington, Pa., Langeloth, Pa.

	\$1.13
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Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium pentoxide, 93-93% V₂O₅, contract basis, per pound contained V₂O₅

	\$1.38
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Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots	\$1.00¢
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Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk	7.00¢
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Boron Agents

Contract prices per lb of alloy, del.

Borasil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

	\$5.25
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Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots, per pound	10.00¢
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Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots

	\$1.30
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F.o.b. Wash., Pa.; 100 lb, up

10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	\$1.00
No. 6	.65¢
No. 79	.50¢

Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.

Ton lots	\$1.46
Less ton lots	1.57

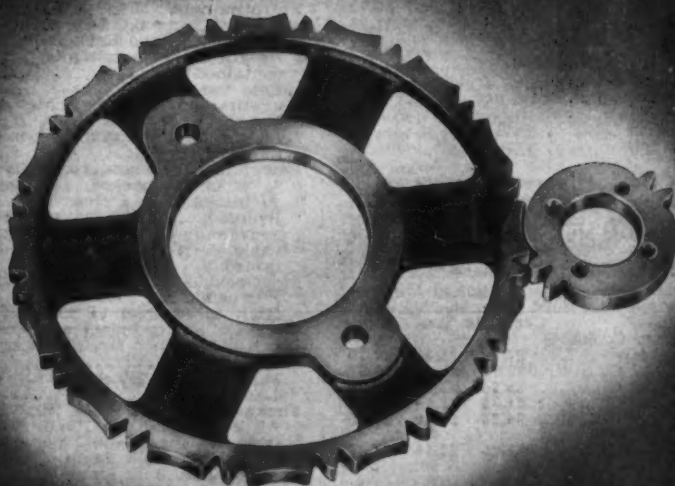
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.

Less ton lots	\$1.80
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Silicas, contract basis, delivered.

Ton lots	45.00¢
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publications

Continued from Page 36

in. after hardening by this method; no grinding or lapping is required.

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For free copy insert No. 9 on postcard, p. 37.

Dust Filters

Complete details on Ruemelin tubular cloth type dust filters are shown in a new 12-p. bulletin. Photos show installations in various industries and drawings illustrate construction features. A table of capacities and sizes for knock-down and assembled filters is included, along with descriptions of various small size and hand operated shakers. Additional equipment is also described. *Ruemelin Mfg. Co.*

For free copy insert No. 10 on postcard, p. 37.

New Lifting Magnets

Features, size ranges, lifting capacities, dimensions and ratings of the new Dings lightweight, all-welded lifting magnet are shown in a new 6-p. catalog. Also included is a cross-sectional drawing detailing construction features, materials and design. Types of controllers for the magnet are illustrated and explained. Installation photographs show some of the types of work in which the new magnet is now being employed. *Dings Magnetic Separator Co.*


For free copy insert No. 11 on postcard, p. 37.

Conveyer, Elevator Belts

Illustrations in a new 26-p. catalog section portray in detail all major parts used in construction of the B. F. Goodrich line of conveyer and elevator belts. The booklet describes all belt features, explains why increased service life with decreased maintenance are made possible, and tells the function which each part of the belt performs. Products described include conveyer and elevator belts, cord conveyer belts, regular and hot material conveyer belts, package conveyer belts, grain conveyer and elevator belts, industrial elevator belts and special conveyer belt constructions. *B. F. Goodrich Co.*

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Resume Your Reading on Page 37



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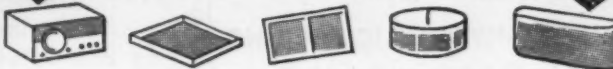
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No. 58 Bliss-Consolidated, With Side Trimming Arm. Approx. Stroke 8", Top of Bolster 54" x 32", Motor Driven, Elec. Equipment Included

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14" x 14" Peerless Hack Saw, Hydraulic Feed—NEW 1942

SHEAR—BAR

Mesta No. 8 Vertical Cold Bar Shear, Maximum Capacity 6" O.D. Carbon or Alloy Steel. Complete with Elec. Equipment. New—Never Used.

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No. 6 KANE & ROACH SHAPE STRAIGHTENER, Belt Drive. Capacity 5x5½" Angles, 2¾" Rounds & Square, 6x1" Flats, etc.

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100,000 lb. SOUTHWARK TATE-EMERY Universal Hydraulic Testing Machine

ITTERBUSH & COMPANY INC.

50 Church Street, New York 8, N. Y.

Phone—Cort 7-3437

CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINES

Mother Hubbard's Closet—Her dog wanted a bone but when Mother Hubbard opened the closet it was bare. Used and rebuilt equipment dealers in the Pittsburgh district know how she felt. They are straining at the leash to fill an increasingly booming demand—but it is getting tougher and tougher to find the equipment to do so.

Transition to wartime production is shutting the gates to those who want to buy new equipment. It has turned them to the used machinery field and those who previously favored the used product want more. The result is a squeeze.

Doorbell Technique—Swamped with inquiries, a major Pittsburgh dealer in heavy steel mill equipment is planning on starting to ring doorbells after the first of next year to pick up machinery. His belief, one that he shares with many other dealers, is that a limited amount of equipment is still around and that its owners are too busy to unload it. The mill-to-mill canvass may lead to results.

Waiting for War Output—On the other hand, equipment that was available for sale several months ago has been withdrawn because the owners think it might play a part in war orders. Tales of skyrocketing prices are the rule not the exception nowadays and some equipment is selling for more than new equipment. A good used machine is like money in the bank.

Bird in the Hand—A recent auction in Pittsburgh saw a press sold for \$33,000, reportedly. New price for the same machine is \$24,000. It sounds fantastic but there's sanity in the background. Deliveries for new machines are becoming more extended. They now lie so deep in the future that plants are willing to have a bird

in the hand than a bird in the bush—even if the costs are heavy.

Scraping the Barrel—Those lucky enough to find really good used equipment in the Pittsburgh area go around bragging. It is practically non-existent and buyers are willing to talk turkey on some of the older stuff. One dealer last spring sold a 36-in. Bullard boring mill with an 11,000 serial number for \$2000. Now he thinks he must have been crazy.

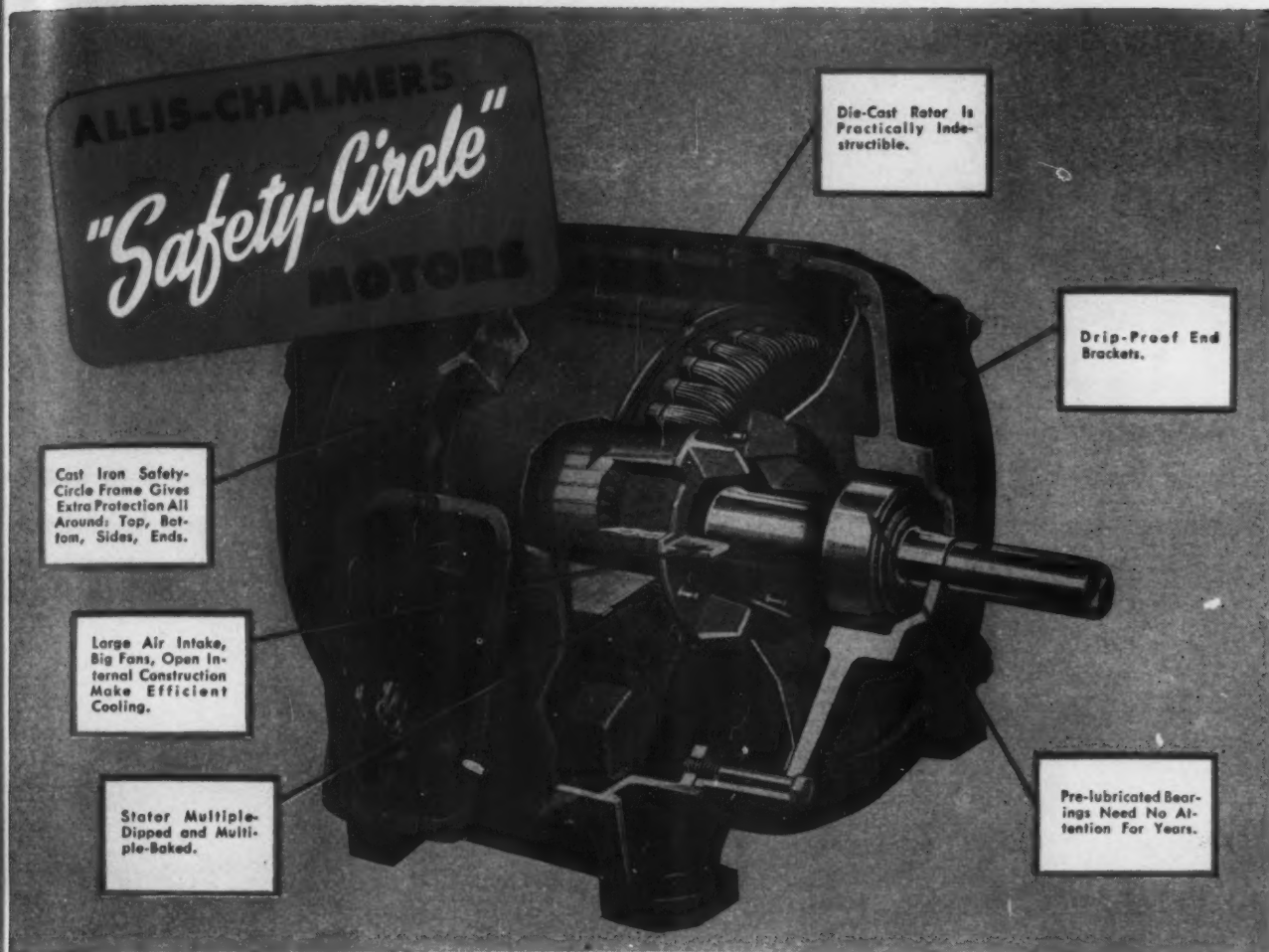
Only recently he learned of the sale of a similar machine with a 7000 serial number that went for \$3700.

Steel Expansion Effects—Steel-making capacity is growing with seven league boots and accordingly the market for cranes is getting tighter and tighter. Ladle cranes are especially tight. What is in stock and what can be unearthed can not match fast-growing demand.

Reasons mentioned before in this column particularly afflict the crane market—extended delivery on new machines, etc.

Electrical equipment—Demand for electrical equipment is strong, putting it mildly. Buyers will snatch up anything they can get. Many, unacquainted with the used machinery field, are turning to it to fill their needs. Even the lowly small motor, a drug on the market several months ago, is moving briskly. Hottest are motor generator sets and plating sets.

Central District Meets—The Central District Chapter, NISA, recently held a meeting at the Electric Club, Chicago. In light of the copper shortage, guest speaker Henry Worthman, of Dow Corning Corp., spoke on the importance of Class H insulation. He offered suggestions for overcoming some of the present problems in handling of varnishes and winding components.



HOW SAFETY-CIRCLE

Means Motor Dependability

EXTRA PROTECTION means extra dependability. That's why Allis-Chalmers protects the working parts of the motor with the exclusive **SAFETY-CIRCLE**. Compare this motor with motors of less rigid construction. The **SAFETY-CIRCLE** motor will not distort in mounting or under strain. And you get the extra protection of drip-proof end brackets at no premium.

EXTRA PROTECTION INSIDE, TOO
Stator is multiple-dipped and multiple-baked in special insulating varnish. Rotor is die-cast aluminum. Stator is mounted in four longitudinal ribs which leaves

plenty of air space between stator and frame. Large fans cast integrally with the rotor and ample air intakes keep temperatures well within rated limits. *Ball bearings are factory-lubricated and require no further attention for years.*

When you shop for motors, remember **SAFETY-CIRCLE** gives you extra protection, extra dependability and lower operating costs.

For details on **SAFETY-CIRCLE** advantages, see your A-C Authorized Dealer or Sales Office or write for Bulletin 51B6210B. Sizes 1 to 20 hp, 326 frames and smaller. *Safety-Circle, Texrope and Vari-Pitch* are Allis-Chalmers trademarks. A-3146

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CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.



PUMPS — Integral motor and coupled types from 1/4 in. to 72 in. discharge and up.

Here's an alternate for type 347 stainless

ELC safety lines

ELC safety lines

If the shortage of columbium is putting Type 347 Stainless Steel out of your reach for important defense work, here's a special Armco grade that may be a suitable alternate. It is Armco Type 304 ELC Stainless Steel.

This Extra-Low Carbon grade can be used in place of columbium-stabilized stainless for welded equipment exposed to service temperatures below 800°F. Above this temperature, Type 321 should be used.

Stabilization with columbium or titanium is not needed with Armco Type 304 ELC because of its low carbon content (.03% maximum). This eliminates intergranular corrosion adjacent to the welds, because no harmful carbide precipitation occurs during welding. Annealing after welding is not necessary, except where engineering require-

ments specify stress-relief after fabrication.

Armco ELC Stainless sheets, strip and plates have proved satisfactory for many applications in the aircraft, chemical, oil, textile, paper, and allied industries.

other types

Extra-Low Carbon Stainless is also available in Armco 18-12 Mo ELC (Type 316 ELC) and Armco 19-12 Mo (Type 317 ELC). Mechanical properties of the ELC grades are similar to those of the corresponding standard grades.

Armco engineers will be glad to talk with you about specific applications for the ELC grades. Just fill in and mail the coupon.

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Doehler-Jarvis First...AS USUAL

One-Piece Die Cast Garnish Mouldings for the 1951 Kaiser



Reprinted from
Kaiser-Frazer News

Die casting may be the answer to your problem, just as it was for the Kaiser-Frazer Corporation in the production of garnish window mouldings for the 1951 Kaiser. The same Doehler-Jarvis research, engineering, and mass-production facilities which made this development possible are available to you.



DIE CASTING IS SO RIGID that only two screws are needed on the long base.



STYLING IMPROVEMENT—rigidity also permits placement of top screws through unexposed edge.



ONE-PIECE DIE CASTING gives better fit—reduces assembly time.



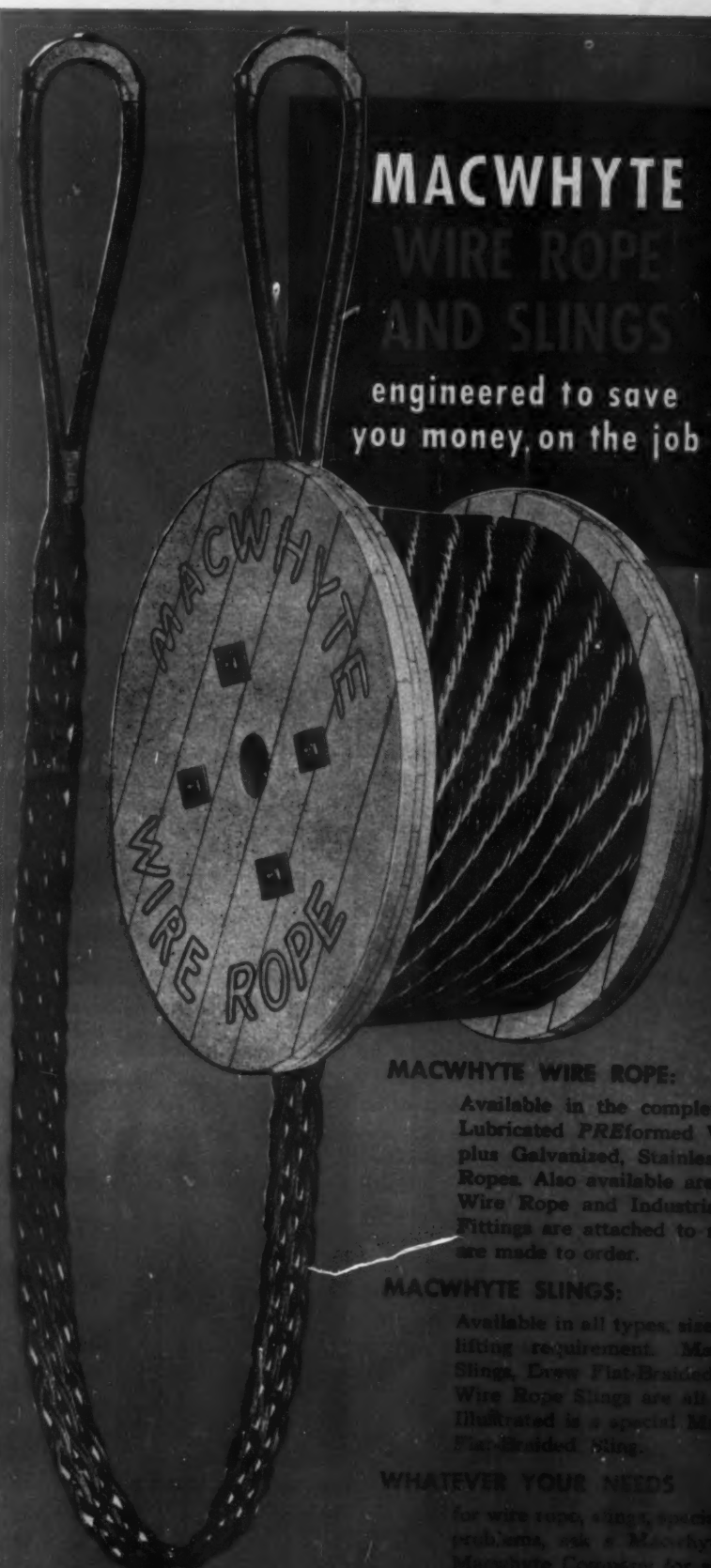
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The World's Largest Producer and Finisher of Die Castings

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EXECUTIVE OFFICES: 386 FOURTH AVENUE, NEW YORK 16, N. Y.

December 28, 1950



MACWHYTE WIRE ROPE AND SLINGS

engineered to save
you money on the job

Ask Macwhyte to recommend the type and size of wire rope best suited for your needs. There are a thousand and one wire ropes made by Macwhyte.

Specifications for the correct sling for any lifting need are yours from Macwhyte for the asking.

Prevent loss!
Save time!
Be sure!

MACWHYTE WIRE ROPE:

Available in the complete Macwhyte line are Internally Lubricated PREformed Wire Ropes for all equipment—plus Galvanized, Stainless Steel, and Monel Metal Wire Ropes. Also available are special assemblies of Macwhyte Wire Rope and Industrial Standards "Safe-Lock" fittings. Fittings are attached to rope by swaging—and assemblies are made to order.

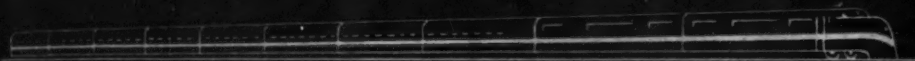
MACWHYTE SLINGS:

Available in all types, sizes and lengths, to meet almost any lifting requirement. Macwhyte ATLAS Round-Braided Slings, Drew Flat-Braided Slings and Monarch Single-Part Wire Rope Slings are all made to order to fit your needs. Illustrated is a special Macwhyte Drew 14-part Type ICT Flat-Braided Sling.

WHATEVER YOUR NEEDS

for wire rope, slings, special assemblies, solutions for special problems, ask a Macwhyte distributor or write direct to Macwhyte Company for suggestions and recommendations.

MACWHYTE COMPANY, 231 Fourteenth Avenue, Kansas, Wisconsin. Manufacturers of Internally Lubricated Wire Ropes, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Ropes. Our distributors and mill agents throughout the U.S.A. and other countries assure you for immediate delivery. Catalog on request. Mill Depot: New York - Pittsburgh - Chicago - Minneapolis - Fort Worth - Portland - Seattle - San Francisco - Los Angeles.



Important in the *Railroad Shop*



Drilling oil hole in aluminum piston.



Gang drilling a $\frac{1}{8}$ " hole in mild steel push rod.

PHOTOS—COURTESY BURLINGTON R. R.

Versatile and speedy Cincinnati Bickford Super Service Radial and Upright Drills, using Hi-Speed tools ranging up to $1\frac{3}{8}$ ", are doing many jobs in railroad shops—such jobs as drilling brake levers, coupler draft keys, coupler yokes.

The handiness of these machines, their ample power for hogging out metal, clean performance and ease of operation are outstanding.

Write for . . .

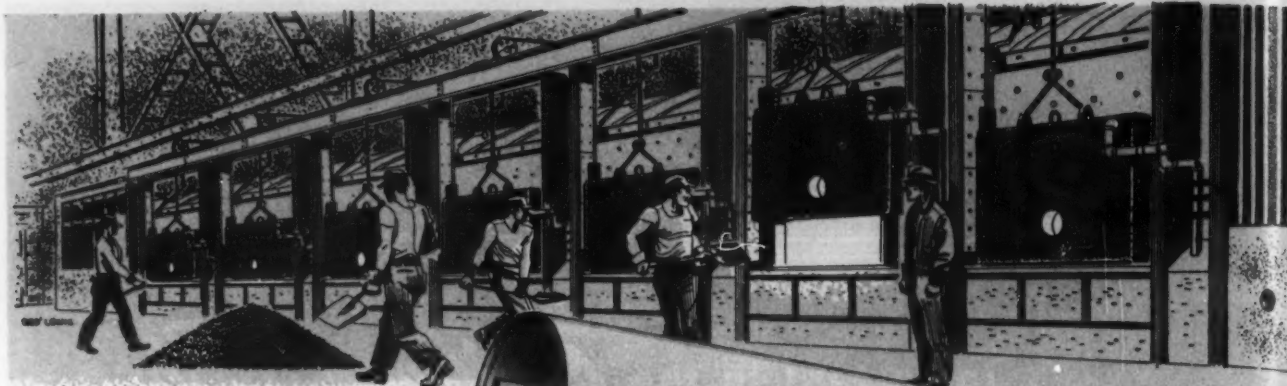
Booklet R-21-B on 9" Diameter Column Super Service Radials; also Booklet U-25 on Super Service Upright Drills.



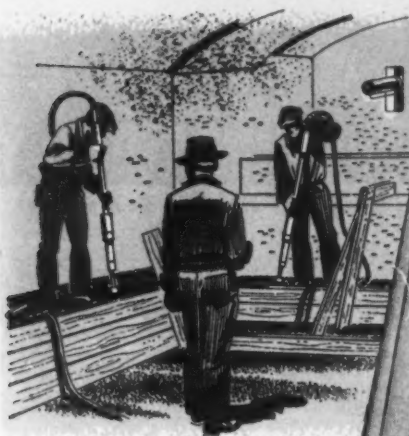
*Equal Efficiency of Every Unit Makes
the Balanced Machine*

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

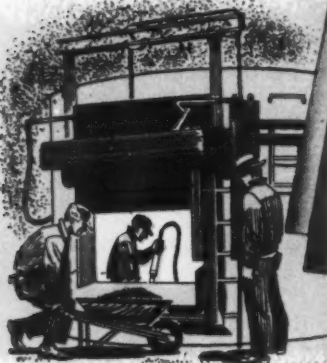
December 28, 1950



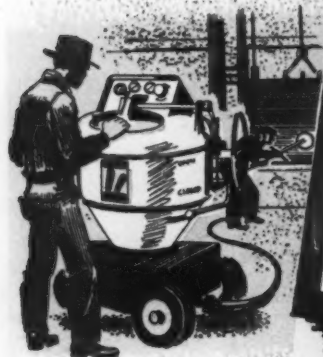
Slagging the Ramset hearth in the world's largest open hearth furnace, prior to charging.



Ramming a Ramset hearth. Use of forms establishes contour of banks.



New Ramset bottom being installed in basic electric furnace.



Repairing backwall and skewback with Gunchrome, air-emplaced through the BRI Gun.

An Unwritten Contract

4. A SALES STAFF WITH A BACKGROUND OF PRACTICAL STEELMAKING

As an initial consideration for your patronage we are equipped to furnish against the delivery schedule you establish, your requirements of refractory products, competitive in quality and price.

To earn an increasing participation in your refractory purchases we add to these basic considerations a sales staff that has a practical steel-making background. Thus, the Basic Refractories' man who serves you combines a sound knowledge of refractories with a furnaceman's understanding of steel plant problems.

Backed by this experience, the Basic Refractories' sales staff has worked closely with the steel industry. For example, they shared in pioneering methods for installing Ramset hearths. They have helped to establish the benefits of the air-emplaced refractories, Gundol and Gunchrome. With the steelmaker, they are constantly striving to develop practices for better utilizing the time-saving refractories, Magnefer, Syndolag and Basifrit.

It is the responsibility of our men to assist your efforts to increase production and lower costs through the use of the right refractory in the best way. Their continuing discharge of this responsibility warrants your consideration of this company as a major supplier of your granular basic refractory requirements.



Basic Refractories Inc., 845 Hanna Building, Cleveland

"no more GAMBLING on tool steel selection"



[1/3 actual size; Selector is in 3 colors]

Since the first announcement, hundreds of tool steel users have received their CRUCIBLE TOOL STEEL SELECTORS. The comments received indicate that this handy method of picking the right tool steel right from the start is going over big.

"Handiest selector I've ever seen"

"No more gambling on tool steel selection"

"You're right, the application should dictate the choice of the tool steel" . . . and many, many more favorable comments.

You'll want your CRUCIBLE TOOL STEEL SELECTOR. It uses the only logical method of tool steel selection—begin with the application to pick the right steel! And the answer you get with one turn of the Selector dial will prove satisfactory in every case, for the CRUCIBLE TOOL STEEL SELECTOR covers 22 tool steels which fit 98% of all Tool Steel applications. ALL the tool steels on the Selector are in Warehouse Stock . . . that means when you get the answer, you can get the steel . . . fast!

Write for your Selector today! We want you to have it, because we know you've never seen anything that approaches your tool steel problems so simply and logically. Just fill out the coupon and mail. Act now! CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

Here's how it works:

To use the Selector, all you need know is the characteristics that come with the job: type and condition of material to be worked, the number of pieces to be produced, the method of working, and the condition of the equipment to be used.

FOUR STEPS—and you've got the right answer!

1. Move arrow to major class covering application
2. Select sub-group which best fits application
3. Note major tool characteristics (under arrow) and other characteristics in cut-outs for each grade in sub-group
4. Select tool steel indicated

That's all there is to it!

Here's an example:

Application—Deep drawing die for steel

Major Class—Metal Forming—Cold

Sub-Group—Special Purpose

Tool Characteristics—Wear Resistance

Tool Steel—Airdi 150

One turn of the dial does it!

And you're sure you're right!!

Crucible Steel Company of America
Dept. 1, Chrysler Building
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Gentlemen:

Sure! I want my CRUCIBLE TOOL STEEL SELECTOR!

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fifty years of Fine steelmaking

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New Sintering Plant... On

... NOW *Exceeding* RATED CAPACITY IN



One of the Nation's Largest!

TY IN PRODUCTION OF QUALITY SINTER



● THE SINTERING PROCESS is becoming increasingly important to the steel industry, because it permits the *maximum* utilization of iron-ore fines and blast-furnace flue dust. Of equal significance is the effect that sintering has on blast-furnace operation—in greater output, lower coke rate and smoother action.

The modern sintering plant, pictured here, was recently constructed for a midwest steel works by Freyn Engineering Company—a subsidiary of Koppers Company.

This Freyn-Design Plant has two sintering machines. For the steel company's blast furnaces, these machines are now producing good quality ferrous burden at well above rated capacity. This sintering plant is designed to use a variety of raw materials.

Constructing sintering plants is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.

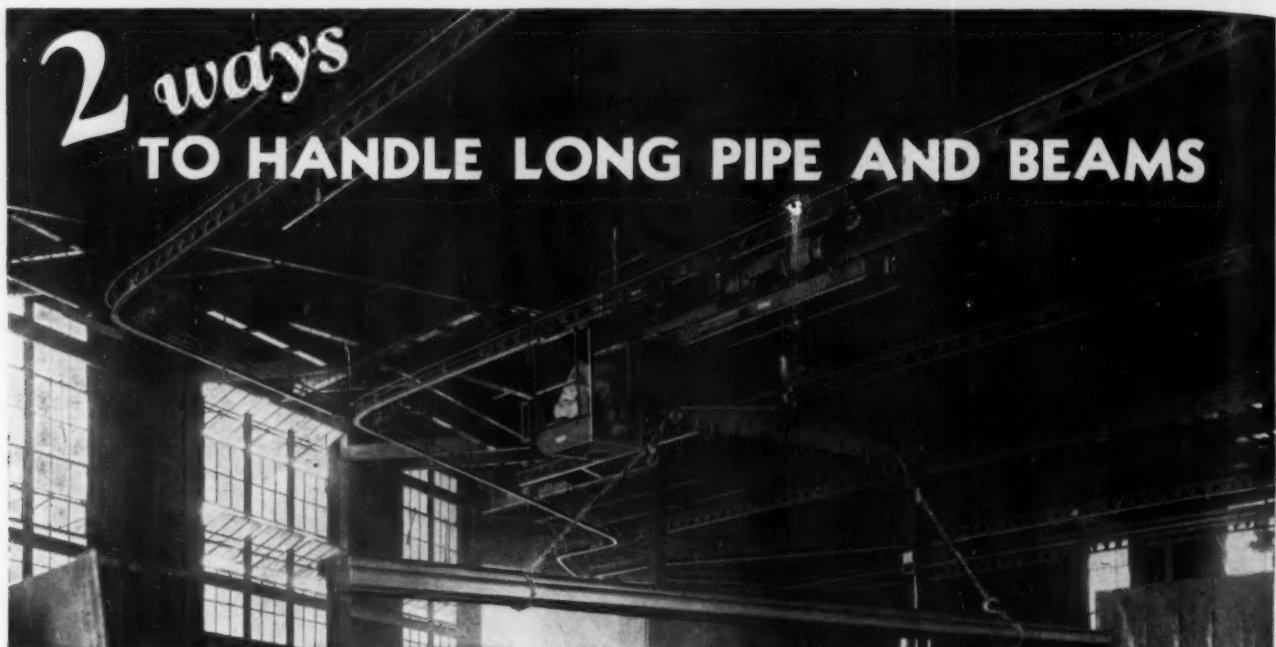


*Engineering and
Construction Division*

KOPPERS COMPANY, INC. • PITTSBURGH 19, PA.

2 ways

TO HANDLE LONG PIPE AND BEAMS

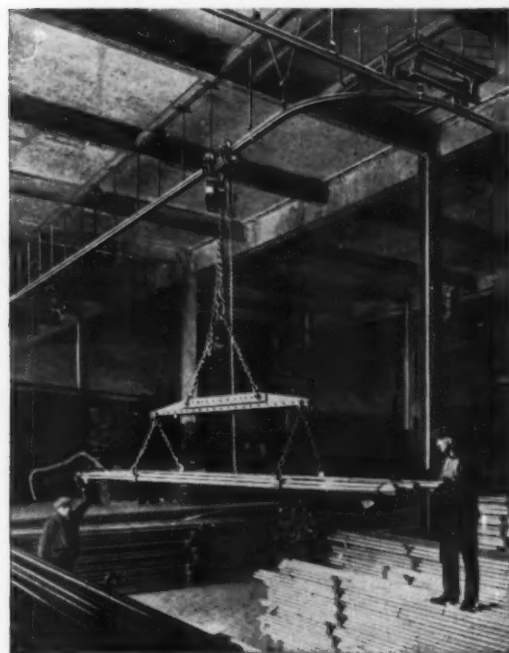


ELECTRICALLY OPERATED TRAMRAIL SYSTEM

Above: This cab-controlled system is equipped with motor-driven hoist and carrier for fast, efficient operation.

MANUALLY OPERATED TRAMRAIL SYSTEM

Below: This simple inexpensive system will save much time and soon pay for itself. Both hoist and carrier are hand operated.



Long pipe, beams and metal stock are heavy and awkward to handle by hand or on floor conveyances. It is difficult to haul them through narrow shop aisles and around corners. In many instances it is necessary to reload onto different types of conveyances in order to overcome floor obstacles and reach the ultimate delivery point.

Cleveland Tramrail materials handling equipment simplifies the transportation of unwieldy materials within or between plants, because it operates overhead above and away from floor obstacles and traffic. It hoists and delivers the materials direct from point to point without in-between handling. Illustrated are two types of overhead materials handling systems for conveying lengthy items. Other manually or electrically operated equipment is built to suit individual requirements.

Now is the time to consider methods of improving plant efficiency. A discussion with your local Cleveland Tramrail engineer may start you on the way to greater production, lower costs, improved safety and other advantages possible with a good overhead system properly engineered.



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THE CLEVELAND CRANE & ENGINEERING CO.
 4855 EAST 284TH ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL

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The Purchasing Agents of America

The Men of the Year for 1950

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COLD ROLLED STRIP STEEL

Coils . . . Cut Lengths . . . All Tempers
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From WAREHOUSE
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Hot Rolled Pickled . . . Long Tempe
Galvanized
Standard or production sizes
or cut to actual working
dimensions
from
WAREHOUSE STOCKS

Whereas, during 1950, they kept their plants turning out civilian goods at the highest rate in our economic history, and

Whereas, they achieved this by their initiative, energy and resourcefulness, in the face of shortages in practically all "hard" commodities

Therefore be it resolved that the Purchasing Agents of America be nominated as The Men of the Year for 1950.

To make this accomplishment possible, all basic industry co-operated. Steel makers, for example, produced more steel than in any comparable period. Steel warehousemen supplied unprecedented tonnages of "spot" steel to enable business, especially small business, to turn out the goods.



**DEPENDABLE DAN
OUR CUSTOMERS' MAN**

We at Reliance are grateful for the opportunity of working with so many of the Purchasing Agents of America. We will continue in 1951 to help them to the limit of our capacity.

**The Season's Greetings
— to All of You —**

For Immediate Action Call The Nearest Reliance Plant or Office:

DETROIT STEEL CORPORATION

PRODUCERS OF

Coke and Coal Chemicals • Pig Iron • Ingots
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GOOD

...ON THE SURFACE

...IN THE MIDDLE

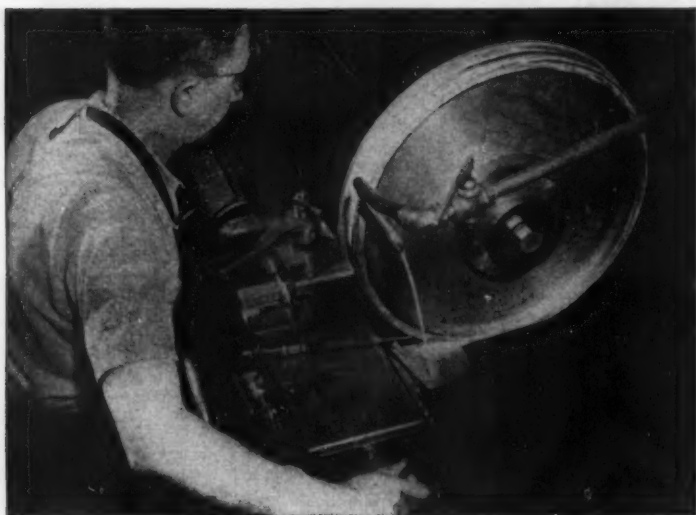
...ALL THE WAY THROUGH

The trim appearance of Bethlehem circular blanks—that bright, smooth, cleaned-up look—symbolizes their overall quality. Users like the rough-machining we do on these blanks; it leaves the steel with a nice, workable top surface, and saves one step in the customer's plant.

But there's far more to the blanks than mere surface beauty. For these circular products are sound from rim to rim; good in the middle, good all the way through. They're unusually homogeneous; have excellent grain structure, uniform density of metal.

One of the reasons is good steel from carefully-made heats. Another is the method of manufacture. The blanks are made in a mill that forges and rolls at the same time, so that the advantages of both processes are combined in the finished product.

Bethlehem circular blanks are widely used in the making of gears, crane and sheave wheels, turbine rotors, flywheels, brake drums, tire molds, and many other similar parts. They are available treated or untreated in sizes from approximately 10 to 42 in. OD. For interesting details, plus scores of application views, write for Booklet 216.



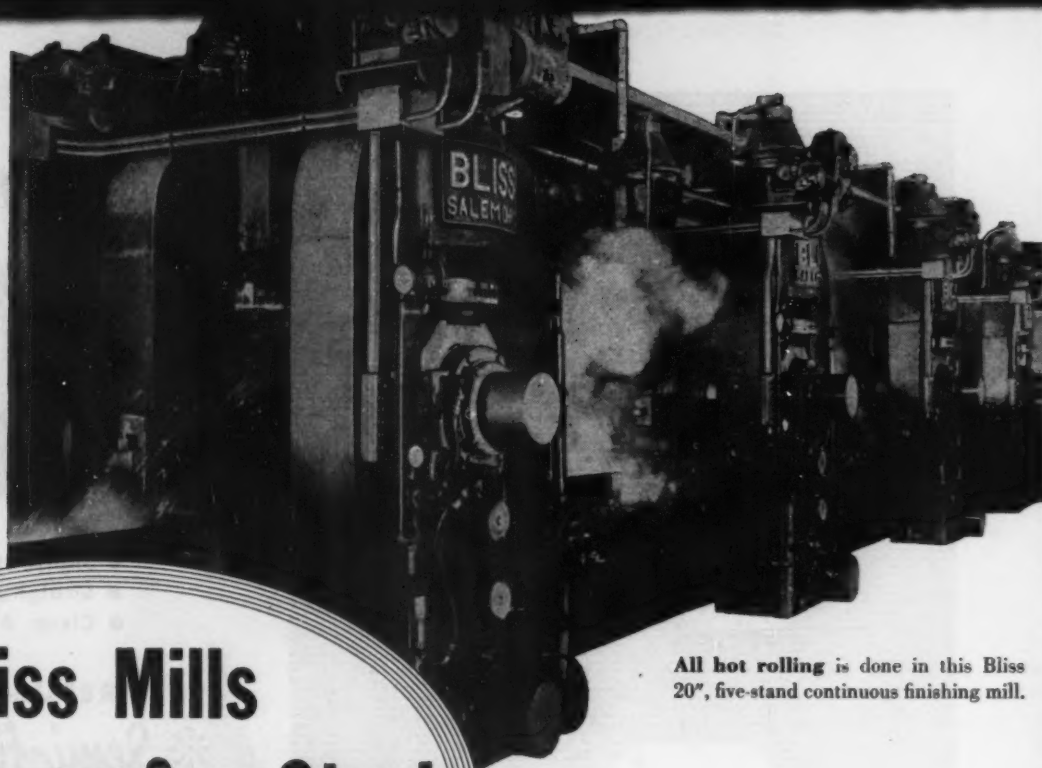
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.



On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM ROLLED-AND-FORGED CIRCULAR PRODUCTS



All hot rolling is done in this Bliss 20", five-stand continuous finishing mill.

Bliss Mills pace Superior Steel expansion

Now, almost all mills and auxiliary equipment used by Superior Steel Corporation to produce "specialty" steels—clad, stainless, special-alloy and high-carbon spring steel—are Bliss-built.

All hot rolling is done on a new Bliss 20", five-stand continuous finishing mill, which replaced two older mills. Since much of the thin stainless steel is slit into very narrow strips, extreme accuracy and flatness are vital. The Bliss mill not only produces more than the former mills together, but turns out a better product, according to Superior engineers.

In cold rolling, a new Bliss Cluster Mill gives optimum precision in light-gauge narrow strip. This mill rolls metal from .020" to .004" and holds tolerances within $\pm .0003$ ".

Close tolerance, high-speed rolling of any metal, in any gauge, is engineered into Bliss rolling mills. Whatever your equipment problem—breakdown, finishing or material-handling accessories—it will pay you to put your problem up to Bliss.

Light-gauge metal is rolled from .020" to .004" in this Bliss 8" Cluster Mill. Tolerances are held within $\pm .0003$ ".



E. W. Bliss Co.

General Office: Canton, Ohio

Rolling Mill Division

Salem, Ohio



Always Accurate

- Sharp, Strong Corners
- Straight, True Sides
- Clean, Accurate Threads

REPUBLIC UPSON

* *Semi-finished and
Cold Punched Nuts!*

—from the more than 20,000
members of the REPUBLIC
UPSON Quality Line.



REPUBLIC STEEL CORPORATION

Bolt & Nut Division

CLEVELAND, OHIO • GADSDEN, ALABAMA

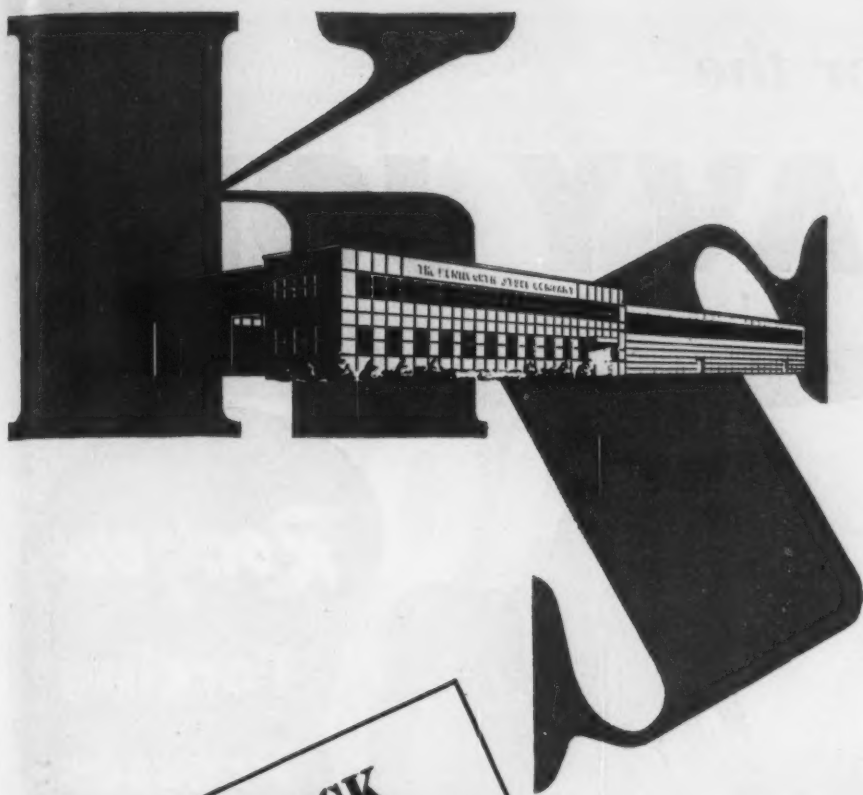
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Republic UPSON

BOLTS AND NUTS

96 YEARS FASHIONING THE FASTENING HABITS OF INDUSTRY



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Spring Steel

Your very need in a wide range of CMP Thinsteel Spring Steel, sizes and physicals, annealed or tempered, may be available now from our stock.

One thing is sure, you can count on coil after coil being accurate to your specifications. Making Kenilworth a source for your Spring Steels further assures you of precision rolled material in thicknesses down to .001" with uniform gauge and fine surface finish. Why not check with Kenilworth right now—phone or write.

3 SLITTING LINES "TIED-IN" WITH KENILWORTH SERVICE

Your metals from .001 to .187 can be handled in widths up to 36". Kenilworth's precision slitting guarantees you minimum camber, minimum burr and closer than standard tolerances when required.



750 BOULEVARD
KENILWORTH, NEW JERSEY

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

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FORCE *for the* HEAVY JOBS

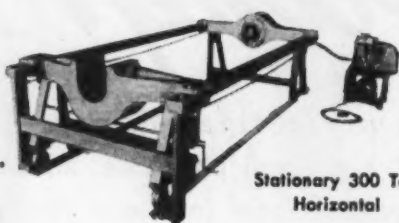


Stationary 600 Ton
75° Inclined

Rodgers
Forcing
Presses



Open Yoke Vertical
150 Ton



Stationary 300 Ton
Horizontal



100 Ton Portable

Choose from this versatile selection of Rodgers Forcing Presses to meet your requirements for pressing, bending, straightening, forming and other operations. Units can be had either portable or stationary; horizontal, vertical or inclined; 100 to 600 tons! They can be powered with either hand operated or power-driven hydraulic pumps.

For rugged, heavy duty work there are three big 600 ton units—75° inclined, 90° inclined and horizontal. Remote controls are included with the power-driven pumps so that operator may work from any desirable location.

Other stationary forcing presses are available in 200, 300 and 400 ton capacities in horizontal, 75° or 90° inclined. Portable units for versatile plant use are available in 100 and 200 ton capacities, with either hand or power-driven pumps. The open yoke vertical press, as shown, is a specially designed unit to meet your applications.

SEND FOR NEW CATALOG

Full information on Rodgers Forcing Presses is given in New Catalog No. 315. Send for your copy today.



Rodgers Hydraulic, Inc.

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HYDRAULIC POWER EQUIPMENT

Another cost-saving advantage for users of

B&W
MECHANICAL
TUBING ...

TAILOR-MADE
PROPERTIES

To match production, fabrication, or end-use requirements

You have a wide choice of
B&W
MECHANICAL TUBING

TYPES—Seamless (hot finished, cold drawn or rockered.) Welded (from hot or cold rolled strip.)

GRADES—Carbon, Alloy, and Stainless Steels.

SIZES—Up to 9-5/8" O. D. in full range of wall thicknesses.

QUALITY—Open-hearth and electric furnace steels, including aircraft and magnaflex qualities.

CONDITION—Unannealed, annealed, tempered, normalized, or otherwise heat-treated as required.

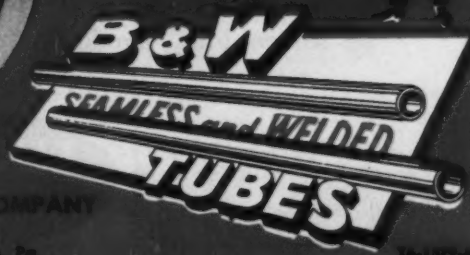
SURFACE FINISHES—As rolled, as drawn, as welded, flash removed, turned, scale-free, and polished.

SHAPES—Round, square, rectangular, oval, streamlined, and special shapes.

FABRICATION—Upsetting, expanding, bending, safe-ending, and machining.

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Because of his factory training in cost-saving tube-techniques ... because he sells nothing but tubes ... he may help you uncover new economies in the purchase and application of mechanical tubing.



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Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

December 28, 1950



Photo Courtesy
Washington Iron Works

"THIS LUCAS CUTS COSTS IN HALF," says the owner

New Series 542 B-120, 4-way bed, Lucas shown here set up to line bore a 5 ton steel casting. Extra wide 120" bed permits long table cross travel. Outer ways are cast integral with bed.

In the plant of Washington Iron Works, Seattle, Washington, working on pieces up to ten tons, "Production time was

improved 59% on one typical operation — 40% on another, compared with previous methods using other modern machine tools," to use the customer's own words.

Whether your work is large or small, single pieces or production operation, there's a Lucas size and type for your needs. Write for literature.

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HORIZONTAL BORING, DRILLING AND MILLING MACHINES
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Thickness Gage

Employs geiger counters to measure tin coatings on ferrous stock.

A new geiger counter tester reportedly measures tin coatings on ferrous stock as thin as 1-millionth of an inch in approximately 30 sec. It permits accurate, economical, non-destructive thickness gaging on one side of a sheet at a time, or on both sides simultaneously. The unit conserves tin by making possible the maintenance of continuous coatings of satisfactory characteristics. Thickness determination can be made at various positions along up to 39-in. wide sheets. *North America Phillips Co., Inc.*

For more data insert No. 13 on postcard.

Piston Ring

Locking feature holds one of the ring ends in against the other.

To lessen the possibility of piston rings catching in engine cylinder ports a one-piece end-locking Sealock ring has been developed. The locking feature prevents the locked end from expanding into ports in a cylinder wall. Less ring breakage has been reported since installing Sealock rings in two-cycle engines. As Sealock tongue is narrower than that on previous rings, it is possible to fit these rings to grooves heretofore considered too narrow for sealing rings. *Double Seal Ring Co.*

For more data insert No. 14 on postcard.

Fork Trucks

Designed for maneuverability and utility in handling 3000-6000 lbs.

A new line of fork trucks has been designed for plants where ruggedness and low maintenance are important and where stand-up-drive is preferred. They feature center-control. The operator stands on the right side of the vehicle

with unobstructed view of the end of the forks. A shockless automotive-type steering wheel is equipped with steering knob to facilitate sharp turning and backing into position. Ease and simplicity of operation are provided in one pedal which controls power and braking. Levers for controlling hoist, tilt, direction of travel and acceleration are located to the operator's right and clearly labeled. Because of accessibility and functional engineering the trucks can be serviced quickly. *Baker-Raulang Co.*

For more data insert No. 15 on postcard.

Electric Cable Hoists

Enclosure of motor within cable drum reduces dimensions and weight.

A new line of heavy-duty electric cable hoists is manufactured in $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2, 3 and 5-ton capacities. Hoists are powered by high torque Ohio motors manufactured for use with Bob-Cat units. Load-lifting and carrying parts are made of steel forgings and castings. The load hook oscillates on ball bearings and swivels on roller bearings. It is suspended on a 5/16 in. pre-formed plow-steel cable. Designed for operation on 220, 380, 440 or

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production ideas

continued

550 v, 3 phase 60 cycle current, Bob-Cats are available with pendant rope control or pushbutton control on pendant cable. *Cleveland Chain & Mfg. Co.*

For more data insert No. 16 on postcard.

Rod Balancing Machine

Balances to close tolerances in processing steel connecting rods.

A new, fully automatic special machine for balancing milling connecting rods to within less than 2 g variation in overall weight has a production rate of 144 pieces per hr at 80 pct efficiency and 180 pieces at 100 pct efficiency. Operation is automatic after locating the workpiece and pressing cycle button. The workpiece is automatically weighed and the scales register the amount each end is out of balance and transmits to the units on both sides, signals which setup these units for correct stock re-

moval. Balancing is accomplished in one pass milling. Tool speed is 654 rpm at 300 fpm with 1 1/4 in. diam tungsten carbide tipped end mills. Feed is 30 ipm. *Snyder Tool & Engineering Co.*

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Rust Preventive

Protects highly finished surfaces prior to storage and shipment.

Saf-pHilm rust preventive is a new dark-colored, solvent type, organic metal preservative that is fast drying, forming a colored, transparent film within 15 min. It is removable with kerosene or solvent; it resists acids and alkalies, abrasion. Application is at room temperature by brush, spray or dip method. *Swan Finch Oil Corp.*

For more data insert No. 18 on postcard.

Flow Transmitter

A through-flow instrument for differential pressure applications.

The V/A cell is a direct-connected differential pressure instrument that converts main-line flow into proportional air pressure and

transmits this air pressure to remotely-located receiver instruments. Being basically a through flow instrument of the variable-area type it measures a by-passed portion of the main-line flow, thus providing continuous self-purging. It is said to feature high accuracy with wide-range, linear scale. It is mercuryless but does not utilize a diaphragm of any kind. The V/A cell is applicable to services on liquids, gas, and vapor streams including steam. *Fischer & Porter Co.*

For more data insert No. 19 on postcard.

Coolant Spouts

Stay put without support; adjustable to any position by touch of the hand.

Bullseye coolant spouts stay in place regardless of the machine vibration or volume of coolant flow. The spouts are leakproof and adjustable to any machine tool. They give unrestricted flow of coolant, allowing lower controlled pressure with little splatter and coolant waste. Spouts are supplied with fittings in combinations most suitable for individual requirements. *J. N. Fauver Co., Inc.*

For more data insert No. 20 on postcard.

Window Brush

Cleans grime from factory windows.

Cleaning windows in factories, foundries and mills can be done with wire brushes mounted on portable tools operating at 3450 rpm. Brushes, from an Osborn disk center section, 6-in. in diam with 0.016 wire fill, down to small Ringlock sections 1 1/2 in. diam can be used for this operation depending on the type of window frame. *Osborn Mfg. Co.*

For more data insert No. 21 on postcard.

Oil-Hydraulic Press

Fast action with high-tonnage pressures are operational features.

The new 50-ton Multipress has precision adjustments for multiple ram action, giving unusual flexibility for applications in many varied industries. The press has a 15-in. stroke, 24-in. daylight opening, and work surface of 31 x 19 1/2 in. Approach of the ram to work is variable and can be preset at any speed desired up to a maximum of 290 ipm, with pressing speeds up

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If you possess any stainless steel of doubtful parentage, now is the time to identify it. Most stainless alloying elements are scarce—some have reached the critical stage.

Any mixed supplies of stainless steels you have in stock have become precious, and well worth sorting out.

To help you, Frasse engineering service has recently revised and reissued our Data Chart, Sec. A No. 3—which describes 10 simple methods for separating stainless from carbon and alloy steels, nickel stainless from moly grades, straight chrome from chrome nickel grades, etc. A detailed expla-

nation of each testing method is also included.

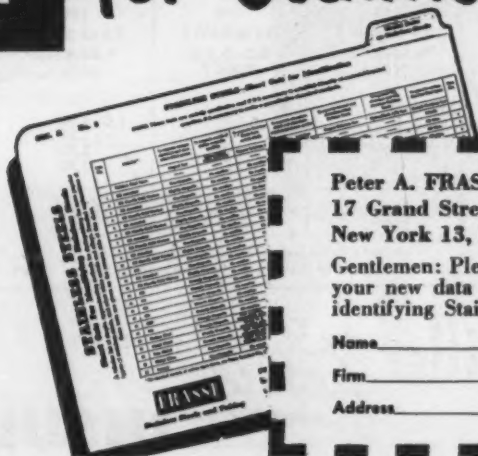
The chart is printed on durable cardboard stock, regular file card size, and can be filed, tacked on a wall, or slipped under glass for speedy reference.

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For use to 2600F

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JM-20

For use to 1600F exposed
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You can make important savings in fuel by taking advantage of the quick heating characteristics of J-M Insulating Fire Brick. These light-weight brick permit a quicker rise to proper operating temperature in the furnace because of their low heat storage capacity, and low thermal conductivity. Where furnaces are being intermittently operated these are two especially important characteristics.

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It will pay you to let a Johns-Manville insulation engineer explain the many ways in which you can save by using these insulations in your furnaces. Just write for further information to Johns-Manville, Box 290, New York 16, N. Y.



	JM-1620	JM-20	JM-23	JM-26	JM-28	JM-3000
Densities, lb per cu ft.....	29	35	42	48	58	63-67
Transverse Strengths, psi.....	60	80	120	125	120	200
Cold Crushing Strengths, psi.....	70	115	170	190	150	400
Linear Shrinkage†, percent.....	0.0 at 2000 F	0.0 at 2000 F	0.3 at 2300 F	1.0 at 2600 F	4.0 at 2800 F	0.8 at 3000 F
Reversible Thermal Expansion, percent.	0.5—0.6 at 2000 F †	0.5—0.6 at 2000 F	0.5—0.6 at 2,000 F	0.5—0.6 at 2000 F	0.5—0.6 at 2000 F	0.5—0.6 at 2000 F
Conductivity* at Mean Temperatures						
500 F.....	0.77	0.97	1.51	1.92	2.00	3.10
1000 F.....	1.02	1.22	1.91	2.22	2.50	3.20
1500 F.....	1.27	1.47	2.31	2.52	3.00	3.35
2000 F.....	—	1.72	2.70	2.82	3.50	3.60
Recommended Service						
Back up.....	2000 F	2000 F	2300 F	2600 F	2800 F	3000 F
Exposed.....	1600 F	2000 F	2300 F	2600 F	2800 F	3000 F

†24-hr. simulative service panel test for JM-3000; 24-hr. soaking period for other brick.

*Conductivity is expressed in Btu in. per sq ft per F per hour of the designated mean temperatures.

Note: Above tests are in accordance with A.S.T.M. tentative standards.

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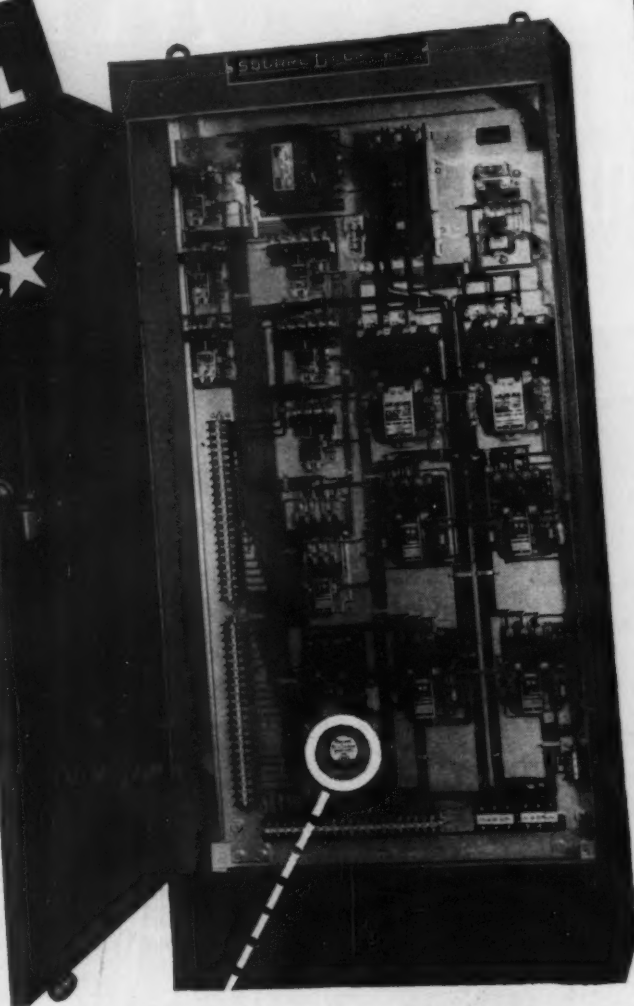
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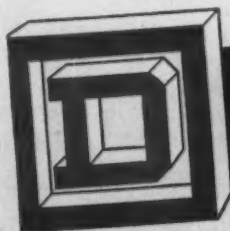


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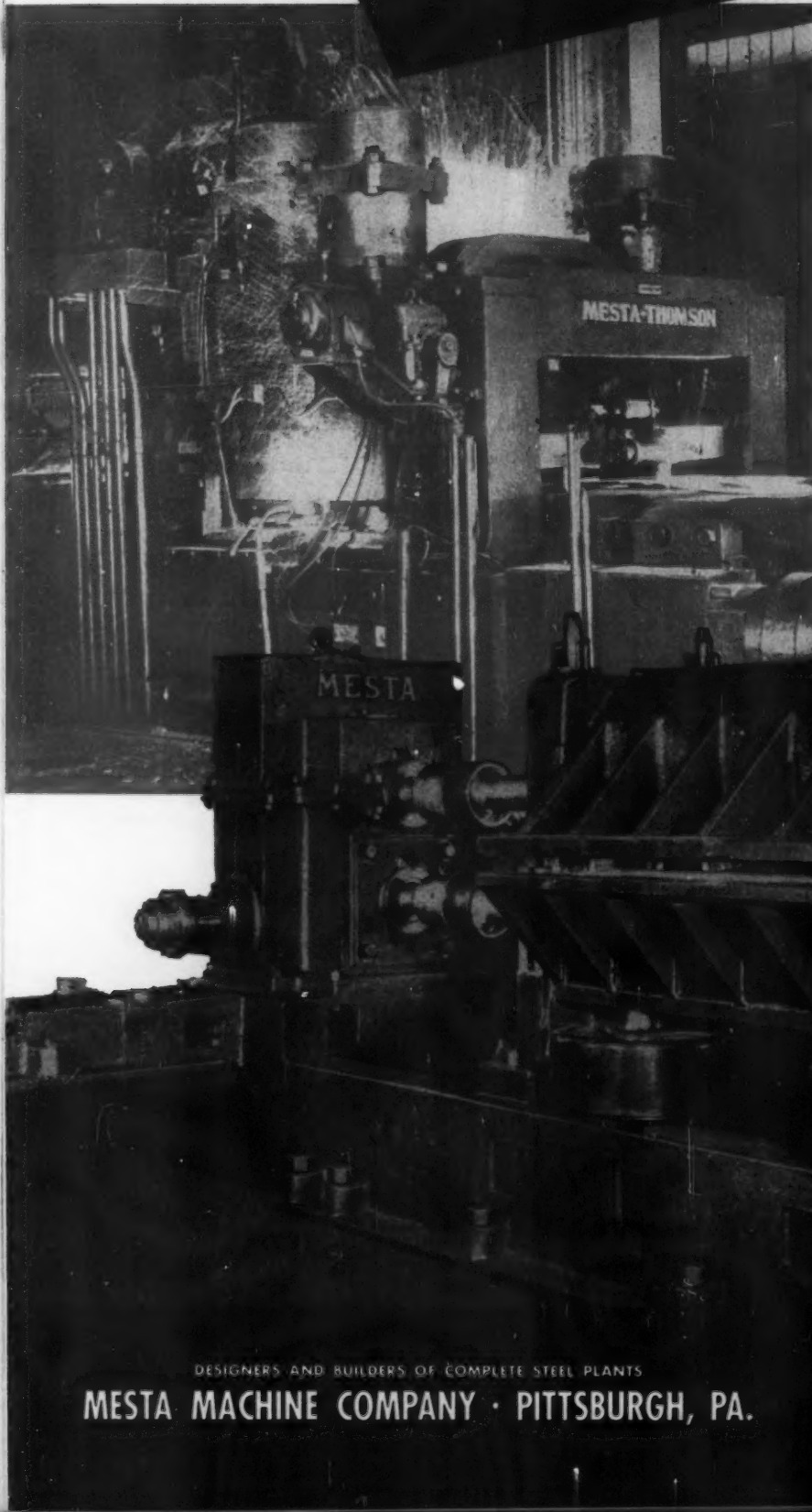
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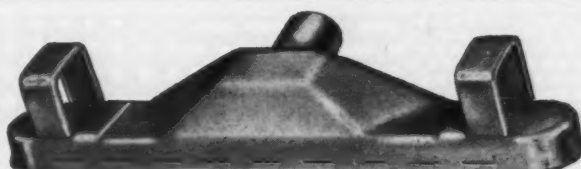
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page 100
Aug. 31.

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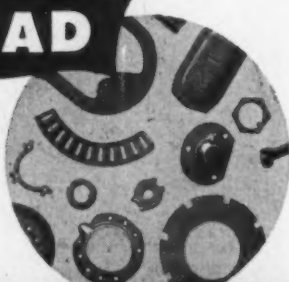
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No. 29U Williams White Bulldozer—Late Model
No. 23 Williams White Bulldozer

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Northern	26" Span 230 Volt DC.
5 ton Robbins Myers	28" Span 230/3/60
5 ton Shepard-Niles	17 1/2" Span 230 Volt DC.
5 ton P & H	35" Span 230 Volt DC.
5 ton Whiting	52" Span 440/3/60 AC.
5 ton OET	56" Span 230/440 AC.
5 ton P & H	68" Span 230 Volt DC.
7 1/2 ton Harnischfeger	31 1/2" Span 230 Volt DC.
10 ton Northern	55" Span 230 Volt DC.
12 ton P & H	38" Span 110 Volt DC.
38 ton Northern	55" Span 230 Volt DC.

CRANE—GANTRY

Model 200 Colby Electric Powered Whirley Crane, Complete with elec. equip. 440/3/60. Capacity 45 ton @ 30' Radius to 10 Ton @ 89' Radius

EYE BENDER

William White, Capacity 1 1/2" Round stock bent hot, 1/2" Round stock bent cold

FLANGING MACHINE

1/2" McCabe Pneumatic Flanging Machine

FORGING MACHINES

1 1/2" Fasttucket
1" Ajax Air Clutch, New 1941
3 1/2" 3", 3 1/2", 4", 5" Ajax
1 1/2" 3" National
7", 5" Acme

FOUNDRY EQUIPMENT

15" x 20" American Wheelabrator Tumblast
#332-38 Osborn Jolt Squeeze Rollover Machine
No. 8 American Wheelabrator Multi-table, Four 48" Dia. Auxiliary Tables
Pangborn Rotoblast Bar Cleaning Equipment, Handles stock 4" dia. x 12" to 40" long

FURNACES

500 lb. Moore Size "T" Rapid Lecomelt Furnace
1 1/2 ton Moore Size "Q" Rapid Electromelt Furnace, Complete with Transformer Equipment
2 Ton Heroult Nose Tilt Type Melting Furnace
2 Ton Heroult Rocker Tilt Type Melting Furnace
6 Ton Heroult Electric Melting Furnace, Complete with 2000 KVA Westinghouse Transformer

GEAR REDUCERS

600 H.P. Westinghouse Reduction Unit Ratio 3:76-1
500 H.P. Mesta Double Reduction Ratio 14:1
600 H.P. Falk Single Herringbone Gear Reducer 360/40 RPM

GRINDER—SURFACE

14" x 36" Pratt & Whitney Vertical Surface Grinder, Motor Driven, New 1942

HAMMERS—BOARD DROP

1200, 1500, 2000, 2500, 3000 lb. Chambersburg
1000, 1200 lb. Billings & Spencer
1200, 2000 lb. Erie

HAMMERS—STEAM DROP

8000, 35,000 lb. Chambersburg
1500, 2000 lb. Erie

HAMMERS—STEAM FORGING

600, 1100, 1200, 1500, 2000, 3000, 4000, 6000 lb. Chambersburg
1000, 1500, 2000, 2500, 4000 lb. N.B.P.
1100 12,000 lb. Erie

HAMMERS—MISCELLANEOUS

No. 2B Nazal Hammer, Motor Driven
1000# Chambersburg Pneumatic Motor Driven Forging Hammer, Complete with Motor
30" x 24" Chambersburg "CECOSTAMP" Hammer

LEVELER—ROLLER

72" Hillis & Jones Roller Leveler, Motor Driven
4 Rolls 5" Diameter

MAGNET

65" Type "SW" Size 6 EC&MCo 230 Volt DC Magnet

MANIPULATOR

8000 lb. Alliance Floor Type Forging Manipulator

MILLING MACHINE—PLANNER TYPE

72" x 96" Ingersoll Planer Type Milling Machine Four Head, Adjustable Rail, A.C. Motor Drive

NAIL MAKING MACHINES

No. 2 Glader Nail Sizes 6D, 7D, 8D, 9D
No. 1 1/2 National Nail Sizes 10D, 12D, 14D, 20D, 30D
Angel Nail Sizes 10D, 12D, 16D, Roofing

NIBBLERS

3/16" Savage Nibbler, Belt Driven
No. 10-B Gray Turret Head Metal Nibbler, M.D.
Capacity 9/16", with Circle Cutting Attachment

PLANERS

32x35"x10' Niles, One Rail Head
48x48"x10' Niles, Four Head
81x72"x33' Niles-Bement-Pond, Four Head
120"x120"x18' Pond Four Head, Motor Driven
16x14x36" Mesta, Four Head

PLANERS—OPEN SIDE

42x42"x10' Cleveland, Three Head
48x60"x22' Cleveland, Three Head
60x60"x16' Detrick & Harvey, Three Head

WE OFFER A COMPLETE LIQUIDATION SERVICE ON ANY BASIS WHICH CIRCUMSTANCES INDICATE WOULD BE MOST BENEFICIAL, WHETHER BY AUCTION, PRIVATE LIQUIDATION OR OUTRIGHT SALE

CONSULTANTS IN MANUFACTURING PROBLEMS FOR OVER A QUARTER OF A CENTURY

THERE IS NO SUBSTITUTE FOR EXPERIENCE

CONTACT US IN CONFIDENCE WITHOUT COST OR OBLIGATION

PRESS—EMBOSING & COINING

Bliss #25-B 600 ton Single Geared Knuckle Joint Press, Complete with elec. equip. LATE

PRESSES—HYDRAULIC

200 ton Elmes Hydraulic Press, Self-Contained 10" Stroke, 33" Distance Between Columns
325 ton Baldwin Southwark Hydraulic Briquetting Press, 24" Stroke, Size of Briquette 6" x 4"
500 ton Southwark Open Throat Hydraulic Press, 13" Stroke, Platen 56" x 56"
1000 ton Chambersburg 4-Column Hydraulic Press, 18" Stroke, Bed Area 43" x 48"
1000 ton United Steam Hydraulic Forging Press Davey Pat. Quick Acting. Distance between columns 7" x 29", Stroke of Ram 48"

PRESS—HYDRAULIC WHEEL

300 ton Hydraulic Wheel Press, 86" Bet. Parallel Bars

PRESSES—STRAIGHT SIDE

F-1220-36 Clearing Press, 18" Stroke, Bed Area 36" x 96", Air Friction Clutch
Version All Steel Single Crank Press, 24" Stroke, Bed Area 40" x 40" LATE
No. 620 Bliss High Production Press Flywheel Type 1 1/2" Stroke, Face of Slide 8" x 16 1/2"

PRESS—TOGGLE DRAWING

No. 14B Bliss Toggle Drawing Press, 55" Between Uprights, 24" Stroke of Blankholder, 28" Stroke of Plunger

PRESSES—TRIMMING

No. 16 Erie Trimming Press, 6" Stroke, Bed Area 30" x 26"
No. 58 Bliss-Consolidated, 34" Between Uprights, 8" Stroke

PUMP—HORIZONTAL

4 1/2"x24" Worthington Horizontal Duplex Pump, Motor-Driven, Capacity 618 G.P.M. at 2000 lbs. Pressure

PUMPS—FIRE

Type CFS Hale Portable Pumping Unit, Capacity 500 Gal. of water per min.
Worthington Fire Pump with 200 H.P. G. E. Motor, Capacity 1500 G.P.M.

PUNCH—BEAM

Long & Allstatter Double End Beam Punch, Capacity Beam Punch End—Punch flanges and web 24" I-beam and smaller

PUNCH—MULTIPLE

No. 4 Hillis & Jones, Motor Driven, 50" Between Housings, Capacity 18 holes 9/16" thru 1/4"

PUNCH & SHEAR COMBINATIONS

#91 Size 16 Hercules Universal Ironworker, Capacity Punch 1-1/16" x 1/4", Shear Plate 1/4", Flat 6 1/4" x 1/4", Angle 6 x 6 x 1/4", Round 1 1/2", Square 1 1/2"
No. 4 1/2 Hillis & Jones Single End Punch, 60" Throat Capacity 1 1/4" thru 1", Architectural Jaw
No. 4 Hillis & Jones Single End Punch, 48" Throat Capacity Punch 1 1/4" thru 1"
No. 5 Hillis & Jones Single End Punch, 48" Throat Capacity Punch 2" thru 1 1/2"

Long & Allstatter Single End Punch, 60" Throat Capacity Punch 1 1/4" thru 1"
No. 2 1/2 Buffalo Universal Ironworker, Motor Dr. Built-in Notcher and Coper LATEST

RIVETERS

50 ton Hanna Pneumatic Yoke Riveter, 102" Throat, 21" Gap
125 ton Hanna Bull Riveter, 75" Reach, 24" Gap
150 ton Chambersburg Hydraulic Gap Riveter

ROLLING MILLS

9 x 29" Schmitz Single Stand Two High
10 1/2 x 14" Standard Single Stand Two High
18 x 38" Birmingham Single Stand Two High
20 x 40" Mackintosh Cold Reduction Mill
22" x 40" Continuous Single Stand Two High
24" x 52" Single Stand Two High Houghing Mill

ROLLS—PLATE STRAIGHTENING

72" x 3/16" Niles Plate Straightening Roll, Motor Driven, Seven 11 1/2" Dia. Rolls, Capacity 1/2" Plate
72" McKay Plate Straightening Roll, 11 Rolls 1 1/2" Diameter
110" x 1/4" Niles Plate Straightening Roll

SAWS

14" x 14" Peerless Hack Saw, Hydraulic Feed—NEW 1942
No. 2 Motech & Merriweather Hydraulic Saw, Capacity up to 6" Rounds
26 1/2" Kling Down Stroke Friction Saw, Motor Driven, Hydraulic Feed, Complete with Pump & Motors
48" Kling Down Stroke Friction Saw, Motor Driven, Hydraulic Feed, Complete with pump and motor

SHEAR—ANGLE

8x21" Long & Allstatter Double Angle Shear, Model B, Complete with Elec. Equip.

SHEARS—BAR

No. 2 LH Lewis Open End Bar Shear, Motor Drive, Capacity 1 1/4" Round
No. 8 Mesta Vertical Cold Bar Shear, Max. Capacity 6", O.D., Complete with Elec. Equip.

SHEAR—GATE

8" Hillis & Jones, Motor Driven, Capacity 1/4"

SHEARS—ROTARY

No. 8A Quickwork Rotary Shear, 10 Gauge Capacity, Equipped with circle cutting attachment
No. 25A Quickwork Rotary Shear, 1/2" Capacity
No. 40A Quickwork Rotary Shear, 1/2" Capacity
No. 60 Quickwork Rotary Shear, 1/2" Capacity
No. 100 Kling Rotary Shear, 1" Capacity

SHEARS—SQUARING

18" x 1/4" Hillis & Jones, Motor Driven
10" x 9/16" Hillis & Jones, Motor Driven

SLITTER

72" Yoder Gang Slitter, Capacity 5 Cuts 20 Ga.

STRAIGHTENERS

No. 1 Medart Two Roll Rotary Straightener, Capacity 1/4" to 2 1/2"
No. 1 Medart Three Roll Rotary Straightener, Capacity 1/4" to 2 1/2"
No. 1 Sutton, Capacity up to 1 1/2" Diameter
No. 2 Sutton, Capacity up to 3 1/2" Diameter
No. 6 Kane & Roach Shape Straightener, Belt Dr. Capacity 5x3 1/2" Angles, 2 1/2" Rd. & Sq.
Model #2-14 Taylor Wilson Straightening, burnishing & Sizing Machine Cross Roll, Capacity 2" to 1 1/2" Kane & Roach Rotary Straightening Roll, Capacity 1/4" to 3/4" Dia.
Kane & Roach 3-Roll Straightener Rolls ground for channels 1" x 1/4" x 1/4" and 1 1/2" x 1/4" x 1/4"

SWAGING MACHINES

No. 60 Torrington, Capacity 5/16"
No. 3A Standard Capacity 1/4" Solid 1 1/4" Tube
No. E Langelier, Capacity 1 1/4" Tubing
No. H6 Langelier, Capacity 3" Tubing

TESTING MACHINES

10,000# Southwark Model S-10-B Hydr. Universal, M.D.
100,000# Olsen Universal, Motor Driven
120,000# Southwark Tate-Emery Universal Hydraulic
200,000# Riehle Two Screw, Universal Motor Dr.
400,000# Amsler Hydraulic Compression Testing Machine

TRANSFORMERS

1000 KVA Westinghouse 3 ph. 60 cy. 13,200 volts primary, 230 secondary
1500 KVA Pennsylvania 3 ph. 60 cy. 13,200 volts primary, 230 secondary
2000 KVA Pennsylvania 3 ph. 60 cy. 13,200 volts primary, 230-105 secondary
30000 KVA Westinghouse 3 ph. 60 cy. 13,200 volts primary, 230 secondary

TUBE MILL

Bull Weld Tube Mill, Complete with Accessories, Capacity 1/4" to 3" Tubing

WELDERS

150 KVA Federal P2-12A Press Type Spot Welder 440 volt single phase 60 cycle
200 KVA Progressive Circular Seam Welder, 440 volt 60 cycle Welding Timer & Idler Knurl Drive

WIRE MACHINERY

4-point Bates Barb Wire Machine, 154 barbs per min., 5" barb spacing
2-point Bates Barb Wire Machine, 236 barbs per min., 4" barb spacing
4-point Emery Barb Wire Machine, 236 barbs per min., 5" barb spacing
22" Morgan 4-Block 4-Draft Continuous Wire Drawing Machine with Roll Pointers
20 Draft Superior Wire Drawing Machine, Capacity Wire 18 Ga. to .011" Motor Dr. Spooling Attachment, Wire Pointer, Wire Puller incl. NEW 1946

Manufacturing

RITTERBUSH & COMPANY, INC.

Equipment

50 CHURCH ST., NEW YORK CITY 8

Liquidation—Bona Fide Auction Sales Arranged
Confidential Certified Appraisals

December 28, 1950

Surplus Mfg. Equipment Inventories Purchased
Consulting Engineering Service

THE CLEARING HOUSE

MILES QUALITY

RALING PRESS. No. 23P60 Logemann hydraulic
BOREMAT. No. 42 Heald
ROBER. Nos. 2112 112C Exello
ROBER. No. 218 Exello double end
BORING MILL. 3 1/4" & 4 1/2" Lucas
BORING MILL. 4" MBP floor type
BORING MILL. 5" Jones planer table
BORING MILL. 52" King vertical
BORING MILL. 84" Gisholt vertical
BORING MILL. 100" MBP vertical
BROACH. No. 4 Oilgear horizontal
BROACH. 10T American dual surface
BROACH. 15T Colonial dual surface
BROACH. No. 1 Foote Burt dual surface
BROACH. 15T-42" No. V3 Lapointe vert.
COMPRESSOR. 355' Ingersoll Rand
DRILL, MULTIPLE. 34 spdl. No. 30 Natco
DRILL, RADIAL. 6' Dreses
DRILL, SENSITIVE. 4 spdl. No. 2 Allen
DRILL, SENSITIVE. 4 spdl. No. 3 Demco
DRILL, UPRIGHT. 21" & 24" Clint. Bickford
DRILL, HEAVY. Nos. 121, 217, 314A, 315 Baker
GEAR HOBBER. No. 130 Cleveland
GEAR HOBBER. Nos. 8H, 12H, 16HS & 18H G.&E.
GEAR HOBBER. Nos. 1 & 5 Lees Bradner
GEAR HOBBER. No. 12 & Type T Barber Colman
GEAR SHAPER. Nos. 7125A & 6 Fellows
GEAR SHAVER. 12" Red Ring
GEAR TESTER. No. 8M Fellows
GRINDERS, CENTERLESS. No. 2 Cincinnati
GRINDERS. 10"x18", 10"x36", 14"x36" Landis
GRINDER. 10"x20", No. 1 B & S, univ.
GRINDER. 12"x36" Cincinnati univ.
GRINDER. No. 72A3 Heald Sizematic
GRINDER. No. 16CP16 & 24-36 Bryant
GRINDER. Nos. 228 & 230 Hanchett opposed disc
GRINDER. 12", 16" & 24" Heald rotary
GRINDER. Nos. 10, 16 & 16A2 Blanchard
HAMMER. No. 5N Nazel pneumatic
HONER. No. H1 Micromatic Hydrohoner
KEYSEATER. Nos. 4 & 5 Mills & Merrill
LAPPER. No. 26F Norton
LATHE. 14"x6", 18"x6" & 20"x8" L. & S.
LATHE. 25"x48" & 40"x88" Leblond
LATHE. 26"x10" cirs. Wickes
LATHE. 36"x16" Bridgeford
LATHE, TURRET. 1A, 3A Warner Swasey
LATHE, TURRET. Nos. 3 & 3AL Gisholt
LATHE, TURRET. 24" Bullard vertical
LATHE, TURRET. No. 5 Foote
LATHE, TURRET. 1 1/2" Oster
MILLER, VERTICAL. No. 3 Kempsmith
MILLER, VERT. No. 3 & 4 Cincinnati
MILLER, AUTO. Nos. 08, 1-12, 1-18, 2-18 & 2-24 Cincinnati
MILLER HYDROMATIC. Nos. 3-24, 34-36, 56-72 & 56-90 Cincinnati
MILLER. No. 12 Brown & Sharpe Mfg.
MILLERS. Nos. 1, 2 & 3 Kent Owens hand
MILLERS. 30", 42" & 84" Ingersoll rotary
MILLERS, THREAD. Nos. 4, 6, 40, CT36 Lees Bradner
MILLERS. Nos. 1-14 & 2-20 Kent Owens
PRESS. 100 Ton HPM Hydraulic
PRESS. 200 Ton Oilgear Hydraulic
PRESS. 1000 Ton Baldwin Hydraulic
PRESS. 600 ton Hamilton forging
PRESS. 150 ton Ferracute coining
PRESS. 1000 ton Bliss coining
PRESS. Nos. 1 1/2 & 1 1/4 C Bliss cam drawing
PRESS. Nos. 304 & 75 1/2 Bliss S.S.
PRESS. P1, P2, P3, P4, P5 Ferracute
PROFILER. No. 12 Pratt & Whitney
RIVETERS. Nos. 3A & 5A High Speed
SAW. No. 203 Campbell abrasive
SHAPER. 24" Columbia universal
TAPPER. Baush radial arm
UPSETTER. 2" National, 4" Ajax

MILES MACHINERY CO.

BOX 770

SAGINAW, MICH.

Buffalo 27-U Ironworker, Punch 1 1/2" thru 1"; shear 6x6x3/4" angles; throat 30"

3" Ajax Single Stroke Solid Die Ball Header, rated capacity 4 1/2" balls, suspended slides, air clutch
Upsetting & Forg. Machs., National High Duty, guided overarm heading slide, suspended slides, 1 1/2", 2", 3"

Ajax & Acme Upsetting & Forg. Machs., not suspended slides, 3/4", 1", 1 1/2", 2 1/2", 3"

W. W. Bulldozers, #1, #2, #3, #4, #5, #8, #4 High Speed

Drop Hammers, 800 # to 2500 #

Nazel Air Forg. Hammer, #68, Cap. 7" sq.

Bradley Hammers, Cushioned Helve, Upright & Compact, up to 500 #

Trimming Press, #59 1/4 Toledo, 385 ton; other trimmers 55 to 200-ton

Bar Shears, Open & Guillotine, 1/2" to 4" Rd.

Minster 88-ton S.S. Press, 16" stroke

#94-A Toledo S.S. Double Crank Tie Rod Press, bolster 40x36"

Bliss Knuckle Joint Press, 250-ton

Single & Double End Punches, various throat depths and caps.

L. & A. Multiple Punch, 8", 150-ton

#50-A Quickwork Whiting Rotary Shear, 3/4"

#5 Quickwork Collier Smith Rotary Shear, 48" throat, 1/2"

#416-C Niagara Circle & Slitting Shear, 1/4"

BOLT, NUT AND RIVET MACHINERY.
COLD HEADERS, COLD BOLT TRIMMERS, THREAD ROLLERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES, POINTERS, THREADERS, WOOD SCREW EQUIPMENT.

Diamond Face Grinder, Segment Wheel 36", Table 84"x24", Hydraulic operated

DONAHUE STEEL PRODUCTS CO.

1913 W. 74th Street, Chicago 36, Ill.

IMMEDIATE DELIVERY

PHILADELPHIA COLD ROLLING MILL

20" x 36", (Extra Rolls 16" x 48", 20" x 42") with Sealed Reduction Drive.

NEWBOLD 3-HI BAR MILL with extra Rolls and 2-Hi Finishing Stand.

4 Continuous Non-Ferrous Rod Benches suitable for Aluminum or Copper.

Swagers and Pointers—All Sizes

National Machinery Exchange, Inc.

128-138 Mott Street New York, N. Y.

"IF IT'S MACHINERY, WE HAVE IT"

HORIZONTAL BORING MILL

5" bar **SELLERS** Floor Type Horizontal Boring Mill, new in 1942. 8' vertical travel of head on column. 10' horizontal travel of column on runway. 10' x 12' floor plate with outboard support.

O'CONNELL MACHINERY COMPANY

1821 Niagara St.—Buffalo 7, N.Y.

BEddford 8500

USED EQUIPMENT FOR SALE

Two (2) Morgan 22" 4 block, 4 draft continuous wire drawing machine with roll pointers.
One (1) Dreyer type 100 CFH Ammonia dissociator 3.5 KW, 110 V, single phase, 60 cycle. Dreyer Company, Philadelphia, Pa.

One (1) 22" 6 double block wood frame take up 1-15/16" spindles, 1-15/16" drive shaft, 36" x 8" steel pulley drive. Lawallen Transmission Jack-shaft.

WIRE DRAWING BENCHES:

One (1) 17 block section 8" blocks, 16" centers, direct ratio for size 20 to 40 Turner, Vaughn, Taylor. (No blocks for these).

One (1) 17 block section 8" blocks, 16" centers, direct ratio for size 20 to 40 Turner, Vaughn, Taylor. (No blocks for these).

One (1) 12 block section for 8", 12" or 16" blocks, 27" centers, direct ratio. (No blocks for these), for dig. #15 to #19 gauge.

One (1) 3 block section 16" or 22" blocks 54" centers, 2-1 ratio, 2" spindles, 20" bevel gears, 2-15/16" drive shaft. (No blocks for these).

One (1) 3 block section 16" or 22" blocks 54" centers, 2-1 ratio, 2" spindles, 20" bevel gears, 2-15/16" drive shaft. (No blocks for these).

One (1) 4 block section 16" or 22" blocks 54" centers, 2-1 ratio, 2" spindles, 20" bevel gears, 2-15/16" drive shafts. (No blocks for these).

One (1) 4 block section 16" or 22" blocks 54" centers, 2-1 ratio, 2" spindles, 20" bevel gears, 2-15/16" drive shafts. (No blocks for these).

One (1) Fidelity 2 head double end screw traverse spooling machine #11413, each unit with four 7/16" removable spindles—equipped with 6 driving collars for wood spools 1/4" to 1 1/2" of wire, 2 independent heads for 12 small spools with 1 1/4" traverse or 8 large spools. Automatic measuring on each unit.

Nine (9) 20 draft Superior continuous draft wire drawing machines with spooling attachments for drawing 8" coils or on spools. Finish size #25 to #40.

One (1) Superior wire puller and die stringer.

One (1) Superior wire pointer.

Three (3) Fig. 674-5 oil filters—Bowser, Inc., Ft. Wayne, Indiana, with three 0 to 100# pressure gauges for filtering dig. oil.

THE SENECA WIRE & MFG. CO.

FOSTORIA, OHIO

8' American Triple Purpose Radial Drill
18" x 50" centers Bradford Lathe
5'15" Carlton Radial Drill
2BL Natco Multiple Spindle Drill
#174 Heald Internal Gap Grinder
BL-2416 Keller Duplicator
72" x 70" centers Niles-Bement-Pond Lathe
28/120 Cincinnati Horizontal Hydrotel
#612A Fellows Gear Shaper

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St., Providence 6, R. I.

For
"HARD-TO-FIND" ITEMS OF EQUIPMENT TRY THE CLEARING HOUSE

THE CLEARING HOUSE

Eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

ENGINE LATHES

18x20" centers Monarch, Geared Head, m.d.
12x24" LeBlond Regal Geared Head, m.d.
12x30" centers Monarch Geared Head, m.d.
12"x8" Lodge & Shipley Geared Head, m.d., taper
12x30" centers Pratt & Whitney Model B, m.d., taper
12x48" centers Pratt & Whitney Model B, m.d.
12x30" Lodge & Shipley Sales, Head, m.d., latest
12x34" centers Lodge & Shipley, m.d., latest
14"x8" bed Hendey Geared Head, m.d., taper
14"x8" Lodge & Shipley Geared Head, m.d.
14"x8" Pratt & Whitney, cone
14"x8" LeBlond, cone
14"x8" Sidney Geared Head, m.d.
14"x8" Springfield Geared Head, m.d., taper
14"x8" Prestite, m.d., taper
14"x8" Pratt & Whitney, cone
14"x8" Sidney G.H., m.d.
15"x8" LeBlond Geared Head, m.d.
16"x30" Reed-Prentiss, m.d., latest
16"x30" Pratt & Whitney Geared Head, m.d.
16"x30" centers Pratt & Whitney, cone, motorized
16"x8" Bradford, cone
16"x8" Hendey Geared Head, m.d.
16"x8" Hendey Yoke Head, taper
16"x8" bed LeBlond, cone
16"x8" Lodge & Shipley Sales, Head, m.d.
16"x8" Lodge & Shipley, cone
16"x8" bed Monarch Geared Head, m.d.
16"x8" Lodge & Shipley, cone, motorized
16"x8" Lodge & Shipley Geared Head, m.d. in leg, taper
16"x8" Monarch, cone
16"x8" Sebastian, cone
16"x10" Hendey Yoke Head, taper
17"x8" LeBlond Geared Head, m.d.
18"x8" centers Lodge & Shipley, m.d., taper
18"x32" centers American Geared Head, m.d., taper
18"x8" LeBlond Geared Head, m.d.

18"x6" bed Lodge & Shipley, cone, motorized
18"x8" Monarch Geared Head, m.d.
18"x8" Greaves-Klusman Geared Head, m.d. in leg
18"x2" Hendey Geared Head, m.d., taper
18"x8" American Geared Head, m.d.
18"x8" Champion, cone
18"x8" Hendey Geared Head, m.d.
18"x8" Lodge & Shipley Sales, Head, m.d.
18"x8" Lodge & Shipley, cone
18"x8" Whitcomb-Blaisdell Geared Head
18"x10" Bradford, cone, motorized
18"x12" LeBlond, cone, motorized
18"x13" centers American Geared Head, m.d., late type
19"x8" LeBlond, cone
20"x48" centers LeBlond Geared Head, m.d., latest
20"x8" American Geared Head, m.d., taper
20"x8" Cisco, cone
20"x8" Greaves-Klusman, G.H., m.d. in leg
20"x10" Sidney Geared Head, m.d.
22"x70" centers Greaves-Klusman Geared Head, m.d., taper
22"x8" Lodge & Shipley, cone
22"x10" Greaves-Klusman, cone, motorized
24"x14" bed American M.D., m.d., taper, late type
23"x12" LeBlond Geared Head, m.o., taper
24"x10" American, cone
24"x10" Greaves-Klusman Geared Head, m.d., taper
24"x10" Lodge & Shipley, cone
24"x12" Bridgeford Geared Head, m.d., taper
24"x12" bed Hendey Geared Head, m.d., taper
24"x12" LeBlond, cone
25"x10" LeBlond, cone
26"x8" Bridgeford Geared Head, m.d.
30"x12" Niles-Bement-Pond, m.d., taper
30"x13" Niles-Bement-Pond, m.d.
52"x12" Lehmann Hydratrol Geared Head, m.d., taper, latest
33"x12" Greaves-Klusman, cone, motorized, taper
36"x36" Niles Heavy Duty, m.d., latest, 2 earriages

36" American Triple Geared Internal Face Plate Drive, m.d., taper
48"x12" bed American, m.d.

PLAIN MILLING MACHINES

No. 000 Brown & Sharpe, m.d., latest
No. 1A Milwaukee, m.d.
No. 1M Cincinnati, m.d.
No. 1 Special Plain Kearney & Trecker Milwaukee, m.d.
No. 1 1/2, 2, 3 Cincinnati, cone
No. 2B Brown & Sharpe, m.d., latest
No. 2 Cincinnati H.S. Dial, m.d., latest
No. 2 Cincinnati Plain H.P., belted m.d.
No. 2 Rockford, m.d.
No. 2G LeBlond, belted m.d.
No. 2H Milwaukee, m.d.
No. 2M Cincinnati, m.d. in base
No. 3 Cincinnati H.P., m.d., p.r.t., late type
No. 3B Brown & Sharpe, m.d., late
No. 3, 4 Kempsmith Maxi-Miller, m.d.
No. 3B Milwaukee, m.d.
No. 3 Van Norman Duplex, s.p.d.
No. 4 Cincinnati H.P., m.d.
No. 4 Ohio, cone
No. 4K Milwaukee, m.d., late type
No. 5 Cincinnati, rest, overarm, m.d.
No. 5 H.D. LeBlond, s.p.d.
No. 5B Brown & Sharpe Heavy, m.d.

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No. 3A Brown & Sharpe, s.p.d.
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SQUIRREL CAGE MOTORS, 3-PH., 60-CY.

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	400	G. E.	JK	2300	514
1	400	G. E.	KT-412	2300	450
1	400	G. E.	KT-412	550	450
1	350	Al. Ch.	AR	440	1760
1	250	Whse.	CS	2300	1160
1	250	Whse.	CS	440	1160
1	200	Al. Ch.	AR	220/440	580
2	125	Al. Ch.	AR	2200	1750
1	125	Whse.	CS-761	440	1750
1	125	G. W.	CS-663	440	430
2	100	Whse.	CS-663	440	1750
1	100	Al. Ch.	AR-226	2200	1160
1	100	G. E.	KT-556	2200	865
0	100	F. M.	HS-201C	440	880
1	100	G. E.	KT-556	550	885

CRANE AND MILL MOTORS 230-VDC

Qu.	H.P.	Make	Type	R.P.M.
1	150/200	Whse.	MCSA-181	450/400
1	150/200	Whse.	MCH-100	370/300
1	100/140	Whse.	MCH-90	500/415
2	100/140	G.E.	MDA-108	500/430
1	100/140	G.E.	MDA-108	500/430
3	100	G.E.	CO-1831	675
1	65/100	G.E.	MDA-107	500/450
1	75/100	Whse.	CK-10	675/500
4	65	G.E.	CO-1811	600
4	65	G.E.	CO-1830	700
3	54/60	G.W.	B.W.	575/480
3	50	G.E.	CO-1810	725
3	50	G.E.	CO-1830	525
1	50	G.E.	CO-2007	540
1	50/63	Whse.	K-10	675/625
4	45/55	Whse.	K-9	515/470
1	40/50	G.E.	MDR-105	550/475
1	37 1/2	Whse.	MT-2	535
1	40/55	C.W.	EW	600/505
2	36/42	C.W.	DW	575/520
1	33	Whse.	K-8	505
3	20	Whse.	K-7	560
2	25	G.E.	CO-1808	725

QU. H.P. MAKE TYPE R.P.M.

2	20	Whse.	K-6	515
1	20	G.E.	SW-15	600
1	19	C.W.	SW-15	560
2	16/19	C.W.	BW	625/560
12	15/19	Whse.	K-5	630/550
2	15/19	G.E.	MDA-406	725/650
1	15	G.E.	CO-1825	1000
1	13/17	G.E.	MDA-103	800/700
1	11/13	C.W.	A2W	1050/910
3	10/13 1/2	G.E.	MDA-404	800/700
2	10/13 1/2	Whse.	MCSA-41	725/610
3	8/9 1/2	C.W.	AW	695/635
5	7 1/2	G.E.	CO-1824	750
3	7 1/2	Whse.	MCSA-31	800/650
2	7/10	G.E.	MDA-102	1025/800
2	7 1/2/10	C.W.	SW-7 1/2	800/675
6	6/7 1/2	Whse.	MCA-20	700/600
3	5/6 1/2	G.E.	MDA-402	1025/825
1	5/6 1/2	C.W.	SW-5	1050/825
1	4/5	G.E.	MDA-101	975/825
4	4/5	G.E.	MDR-101	975/825

SYNCHRONOUS MOTORS

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	4350	C.W.	.8	13800	514
1	4000	Whse.	.8	5000	600
1	3500	Whse.	.1	4800/2400	720
1	1500	Whse.	.8	2200	720
1	700	G.E.	.8	2200	720
1	450	G.E.	.8	440	360
1	400	Whse.	.8	440	600
1	388	Al. Ch.	.1	2200	900
2	250	Al. Ch.	.9	2200	514
1	200	Whse.	.8	440	360
1	150	G.E.	.1	3200	900
1	150	G.E.	.8	550	450
1	150	G.E.	.8	2200	600
3	125	EL.Mch	.1	4800/2400	900
1	125	G.E.	.8	2200	900
3	100	Whse.	.8	440	1800
1	100	Whse.	.1	2200	1200
1	100	Idem	.8	440	900
2	100	G.E.	.8	440	600

MOTOR GENERATOR SETS

Qu.	K.W.	Make	RPM	Volts DC	Volts AC
1	2400 (3U)	Al. Ch.	720	525	4800/2400
1	2000	Whse.	600	600	2300
2	1500	Whse.	514	250	4600/2300
1	1500 (3U)	Al. Ch.	720	525	4800/2400
2	1000	G.E.	514	275	4800/2300
1	750	Whse.	900	600	2300
1	700 (3U)	G.E.	720	250	2300
1	600	G.E.	720	300	2300
1	500	Al.	720	525	2300
1	500 (3U)	Whse.	1200	120/240	4800/2300
1	200	Whse.	900	250	2300
1	200	Ridgeway	900	275	2300
1	155	G.E.	120	250	2300/440
1	150	Al. Ch.	1200	250	2300/440
1	100	Ridgeway	1200	275	4000/2300
1	45	C.W.	1200	250	2300/440
1	75	Whse.	900	15	2200
1	75	Al. Ch.	900	250	2300
1	75	Star	1200	230	440/220
1	50	Reliance	1750	230	440/220
2	25	Whse.	1200	120/240	440/220

3U—3 unit set

TRANSFORMERS (Oil Cooled)

Qu.	K.V.A.	Make	Type	Phase	Voltage
2	4500	G.E.	HT	3	27000/13500/2300
3	4000	G.E.	HT	3	22000/2300/4000 Y
1	3750	Whse.	S	3	67000/14400/3400
1	3750	Whse.	S	3	67000/2400
5	500	G.E.	HT	3	14400/13200/480
3	500	G.E.	HT	1	13200/11880/220/-
30	100	G.E.	HT	1	14400/12870/240/-
3	100	Whse.	SS	1	12075/10955/230/-

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8" stroke, maximum opening 6 $\frac{3}{4}$ ", geared for 14.4 strokes per minute on 60 Cycle; 12 strokes per minute on 50 Cycle operation.

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Bullard 42", Vert., two hds on cross rail
Cleveland #1, Horizontal, 2 $\frac{1}{2}$ " bar
Barnes #3, Horizontal, 3" bar
P & H floor type, Horiz., 4" bar
Head #44 Borematic, complete, NEW 1941

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American 5' 14", Triple Purpose, Plain
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American 7' 16", Triple Purpose, Plain

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Lees Bradford #40 Automatic Thread Miller
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Monarch 12 x 54 Model "CK" Screw Cutting Engine Lathe, taper, new 1942
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Baker #1 Keyseater, REBUILT, FIRST CLASS
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Cincinnati #0-8 Vertical Miller, NEW 1942
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Cincinnati 16" Back Geared Shaper
Gould & Eberhardt 20" Back Geared Crank Shaper
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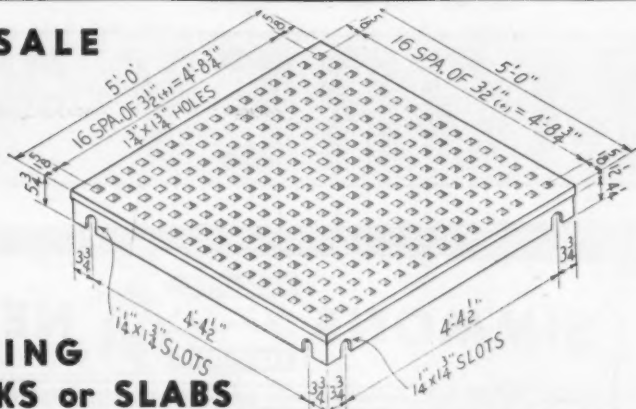
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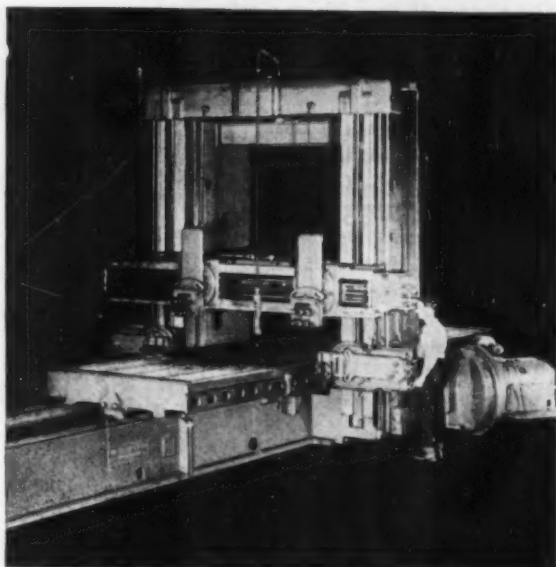
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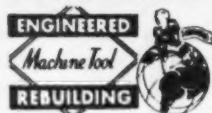
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GRINDER, 16Y28 Bryant Int. 1943
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LATHE, Roll, United Engrs., 28" capty. x 9" con.
LATHE, 60" x 45" cen. Mackintosh-Hemphill, 1942
LATHE, 60" x 30" Bed, Pond, Cone M.D.
LATHE, 50" x 20" cen. Amer., 2 carr., 2 T.A., late
LATHE, 48"-58" x 25" cen. Wlekes, 1942
LATHE, 48" x 20" cen. Simmons, hvy., like new, 1942
LATHE, 36" x 20" cen. Niles, 2 carr., T.A., A.C.M.D.
LATHE, 32" x 25" cen. Pittsburgh, 2 carr., 2 T.A., '42
LATHE, 22"-24 1/2" x 48" cen. SKODA, New
LATHE, 16" x 54" cen., Bradford, T.A., New
LATHE, 14"/10 1/4" x 30" cen. L & S, T.A. '43
LATHE, 12"x30"; cen. Pratt Whitney Tool Room, New
TURRET LATHE, 28" Libby, "C", 4 1/2" capty.
TURRET LATHES, Nos. 1A & 2A W. & S., older
MILLER, 36-50 Cincinnati Duplex Hydro., 1942
MILLER, HOR., No. 4B, B. & S., plain, late
DUPLICATOR, 2416 Keller, 3 spln., 3 dim.
MILLER, VERT., No. 4 Kemp Smith Maxi-Mill
MILLER, VERTICAL, No. 2M Cincinnati, 1942
MILLER, VERT., No. 3 Cincinnati, Dial, late
MILLER, UNIV., No. 2 LU Van Norman, 1942
PLANER, FROG & SWITCH, 42"x18" x 10' N.B.P.
PLANER, OPENSIDE, 36"x54"x18" Cleveland 3 hds
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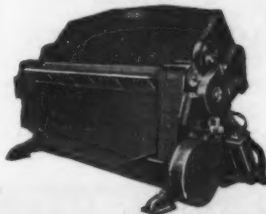
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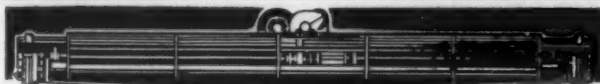
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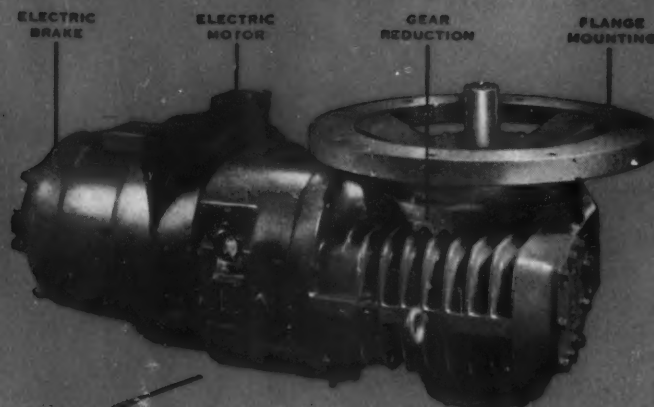
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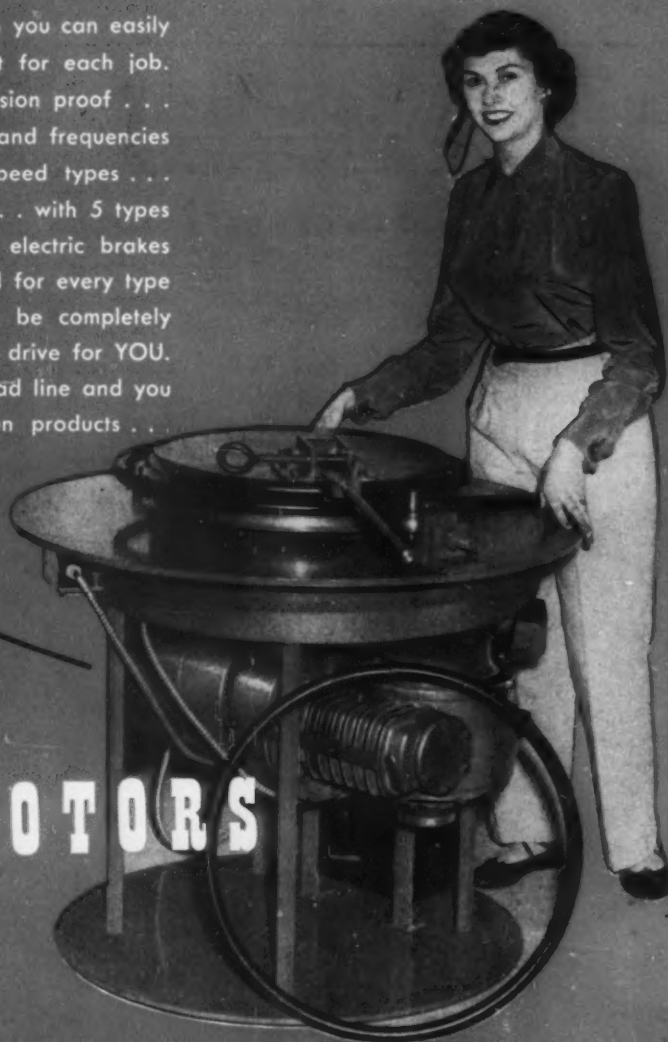
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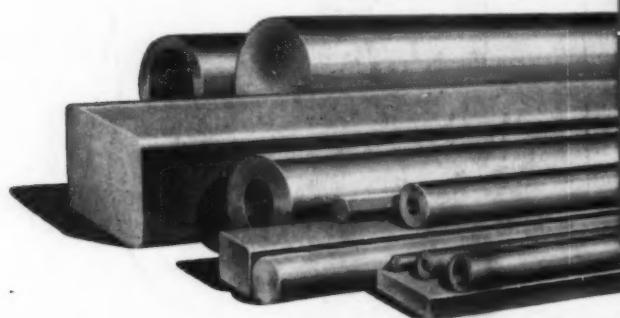
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